DORNIER DO 335
"PFEIL"

THE LAST AND BEST PISTON-ENGINE FIGHTER OF THE LUFTWAFFE

Nowarra

DORNIER Do 335

Schiffer Military History

Dornier DO 335 A-02, VG+PH, No. 240102, after restoration, before being taken to the German Museum.

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THE LAST AND BEST PISTON—ENGINE FIGHTER OF THE LUFTWAFFE

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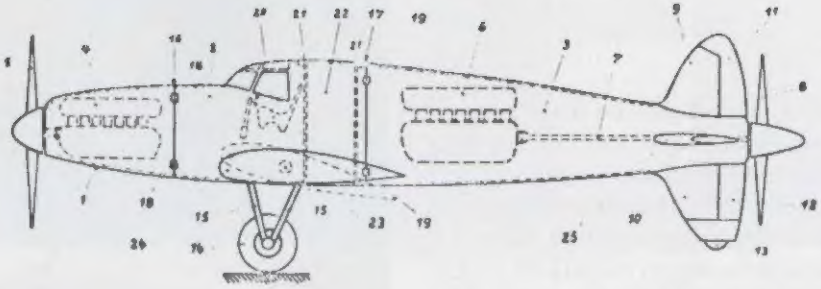
Bow motor of the Do 335 A-02, VG+PH

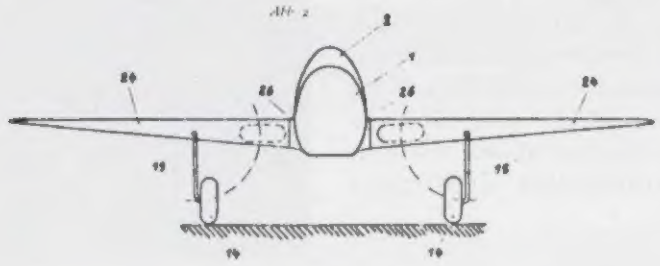
Development

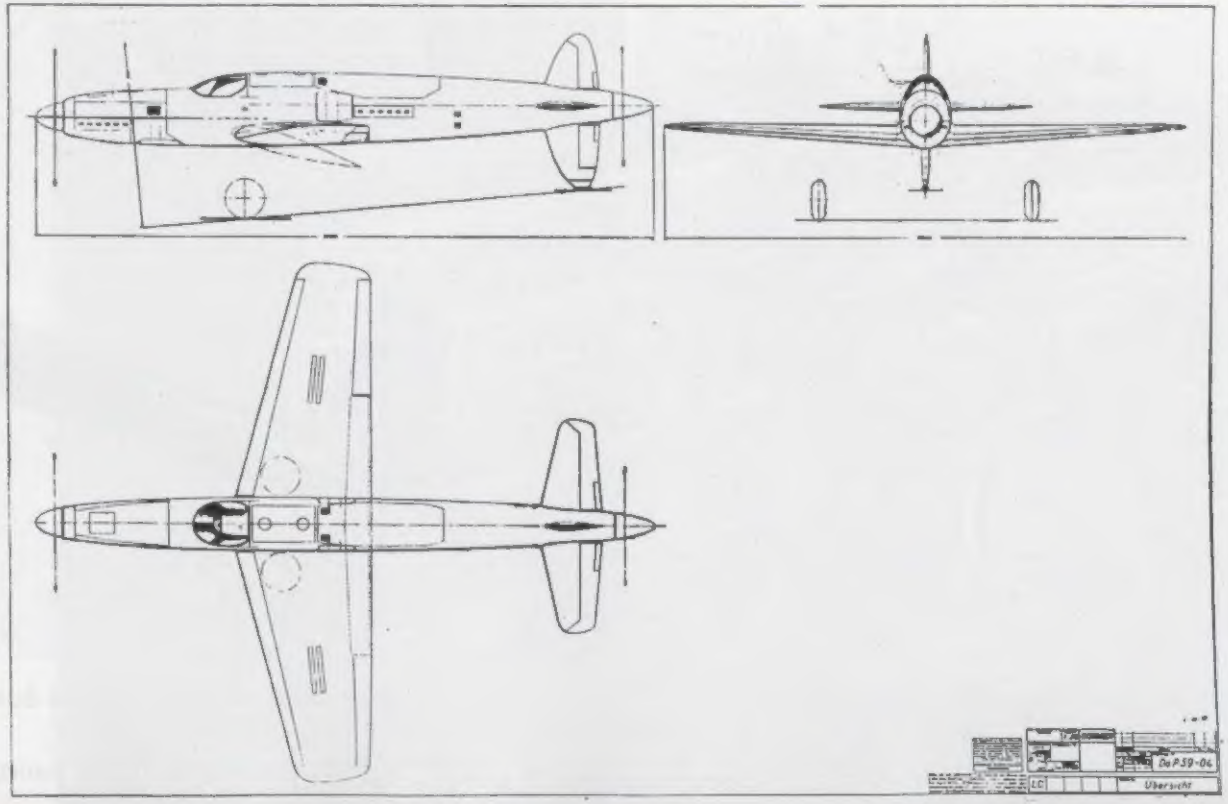
During World War I, in 1915-16, Claude Dornier built pairs of 240-HP Maybach motors into his second giant flying boat, the Rs II. in tandem arrangement, and did the same in the designs that followed, the Rs III and Rs IV. After 1918 there then appeared his famous "Wal" (Whale) flying boats and the designs that followed them, in which this motor arrangement was always used successfully. In 1936 the Do 18 flying boat appeared, in which for the first time the rear motor of the tandem pair was driven by an extension of the crankshaft. This gave him the idea that one could also locate the pilot between the two powerplants. This led to Patent No. 728044 (Class 62b, Group 303) of August 3, 1937, on the basis of which Dornier developed the P.59-04 high-speed bomber.

In the war situation prevailing in 1940, though, the Technical Office of the Air Ministry (GL-C) saw no need to develop such a revolutionary design, and as Göring, responsible for the Four-Year Plan, wrote to Air Minister Funk on February 3, 1940: "By all means, the plans must be furthered that will come into being in 1940 or by the spring of 1941. All other programs, which would come to fruition later, must, if they require economic outlays, be postponed in favor of the aforementioned plans."

Thus the P.59-04 was dead for the time being, and the plans were filed. But Dornier was convinced of the performance capability of the design and gave the glider-building firm of Schempp-Hirth a contract to build a Göppingen Gö 9 experimental plane that would prove the advantages of tandem



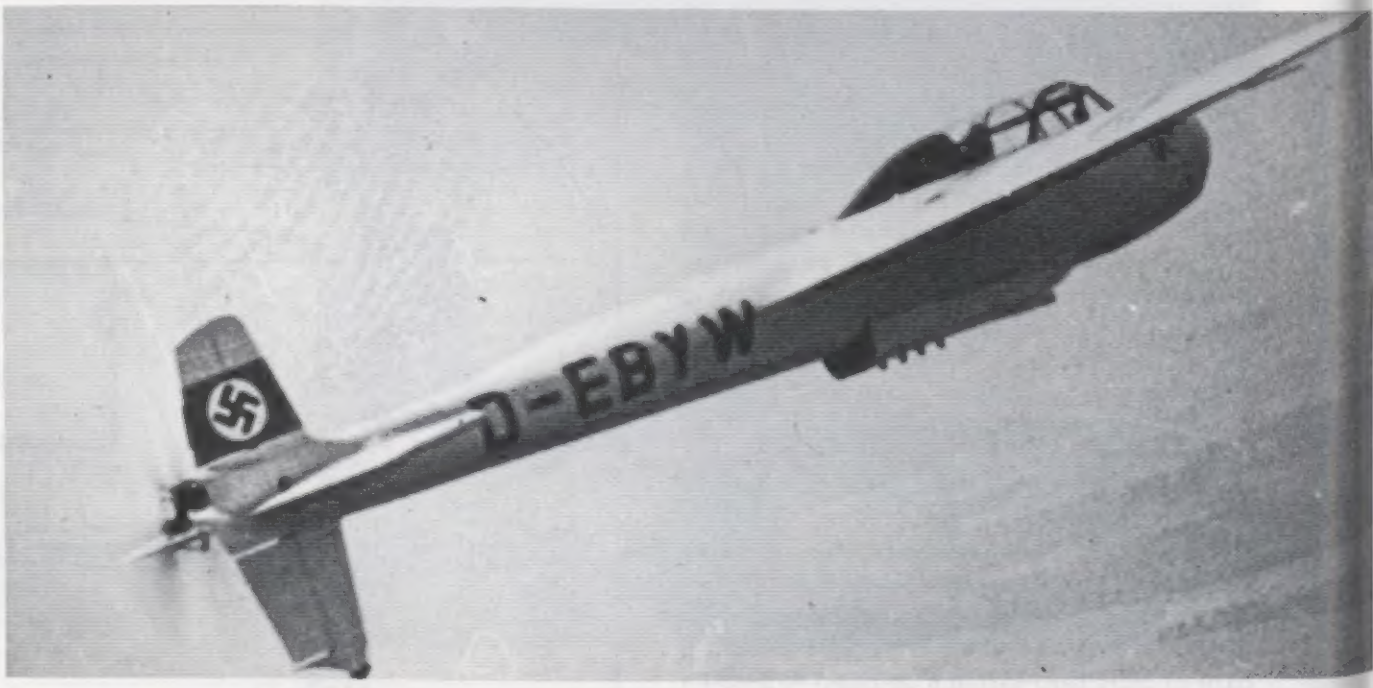




construction and, above all, the feasibility of driving an airscrew at the rear of a plane by a long shaft without vibration.

The Gö 9 was built by Hütter and flown at Wüsterberg before the end of 1940. It was a Do 17, diminished in size to a scale of 1 : 2.5, with an 80-HP Hirth HM 60 R motor. The plane had a wingspan of 7.20 meters, a length of 6.80 meters, and a flying weight of 720 kg. It reached a top speed of 220 kph. The testing of the Gö 9 proved that the rear airscrew powered by a long shaft worked without problems. But the attitude of the Air Ministry remained negative.

The Göppingen Gö in Wüsterberg, 1940



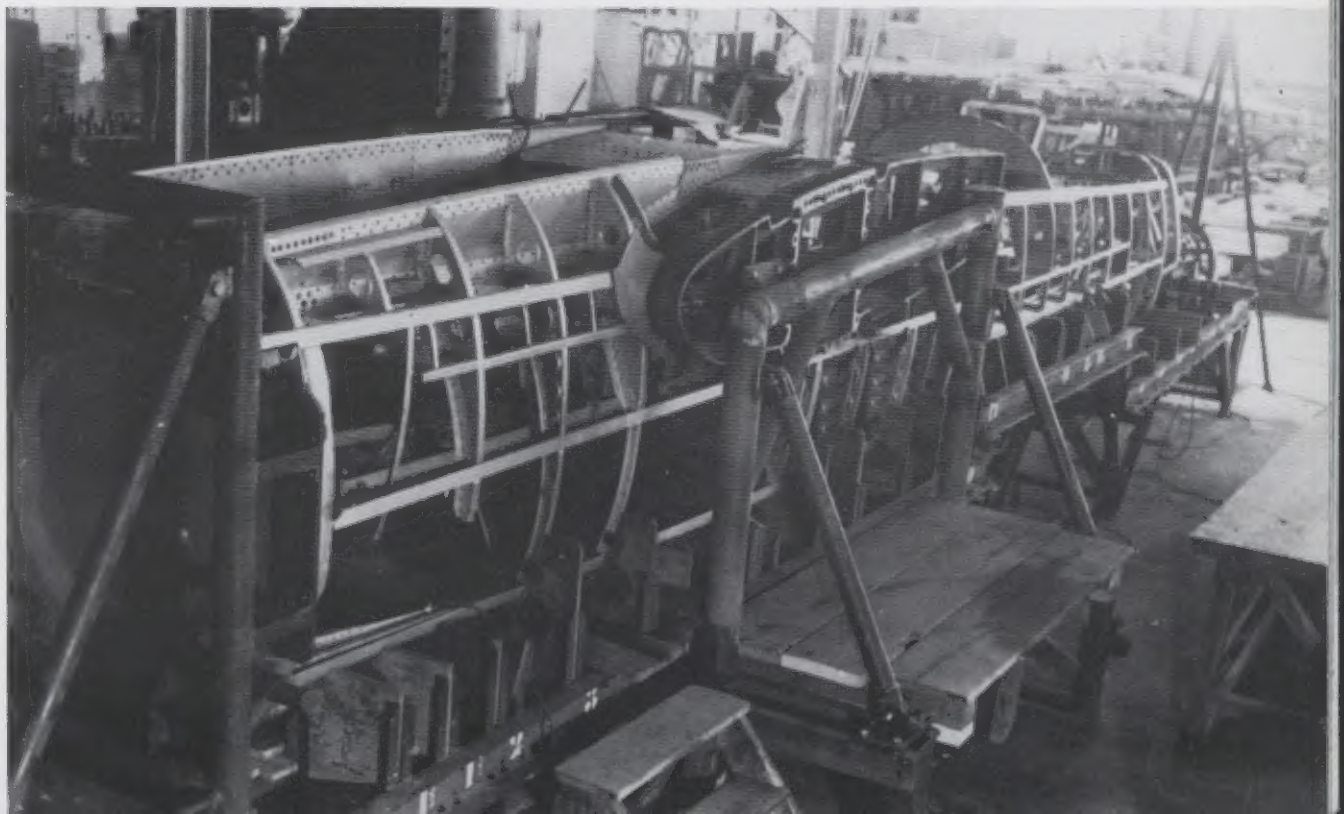
Above: The Göppingen Gö during testing.

Left: 3-way view of the Göppingen Gö 9.

But Dornier was convinced of his idea's success and had a new project, on the basis of the old P.59, carried out in three versions: P 231/1 with two Daimler-Benz 605 E motors, P 231/2 with two DB 603 G and different wing geometry, and P 231/3 with mixed powerplants. The P 231/3 was developed further, until May of 1943, into Project P 232/2, with mixed DB 603 and Jumo 004 C motors; it was intended to attain a top speed of 773 kph with a range of 1250 km. But this project was cancelled in the fall of 1943. Meanwhile the Air Ministry had decided in favor of a different solution. Project P 231 was to be built in somewhat changed form as the Do 335. The Director of the Developmental Department in the Technical Office of the Luftwaffe, Dr. Pasewaldt, delayed issuing a contract, and Dornier turned directly to the Luftwaffe Inspector, Field Marshal Milch, who then issued a contract for the construction of about a dozen test planes. But at first only eight test machines were to be built, along with 35 Do 335 as high-speed bombers—and an additional series of Do 335 as a kind of pursuit bomber. Production of the large series was planned for February of 1945.

On June 7, 1943 Hitler himself intervened in the Do 335 program, advocating not only the Me 262 but also the expediting of the Do 335 high-speed bomber program. Only after Messerschmitt influenced Hitler on September 7, 1943, by hinting that their Me 262 was better suited to be a high-speed bomber than the Arado Ar 234 and Do 335, did the Me 262 receive sole priority. All of Milch's requests in favor of the Ar 234 and Do 335 were pushed aside.

Above: Do 335 wing spar, below: Tail under construction.

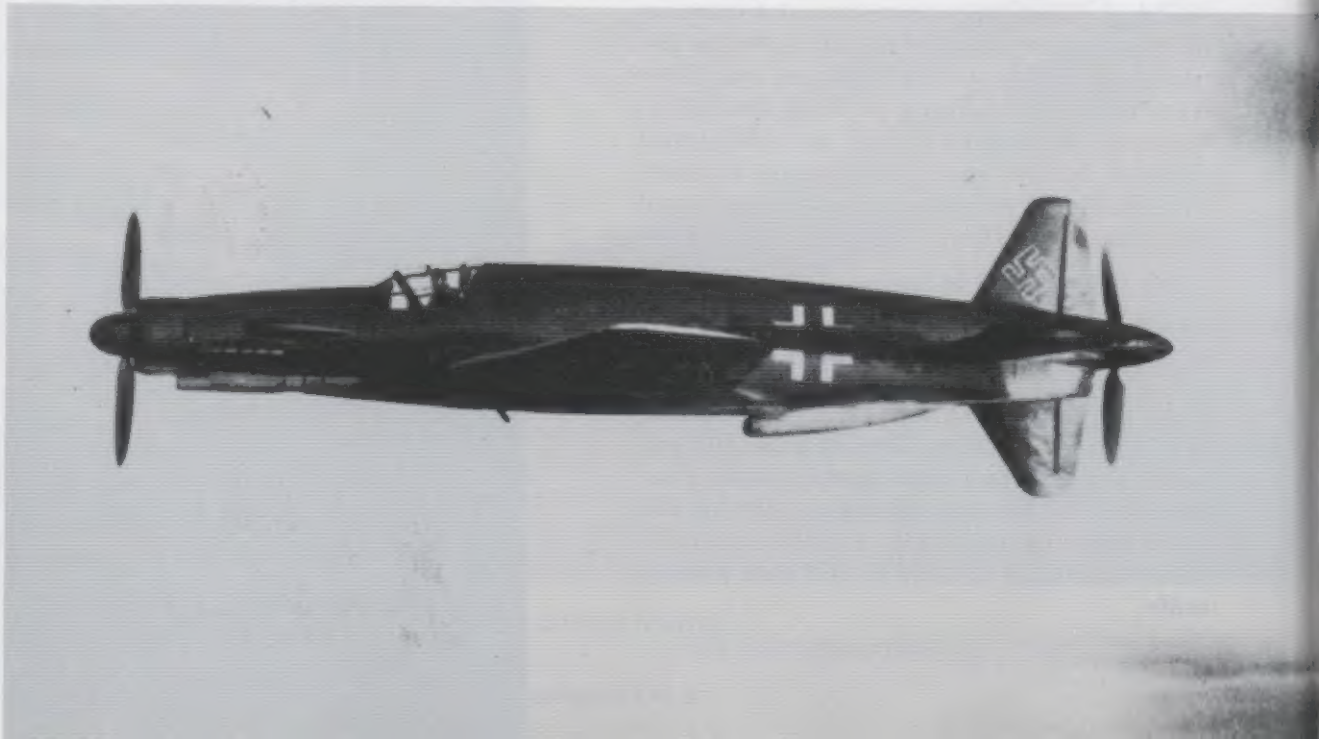


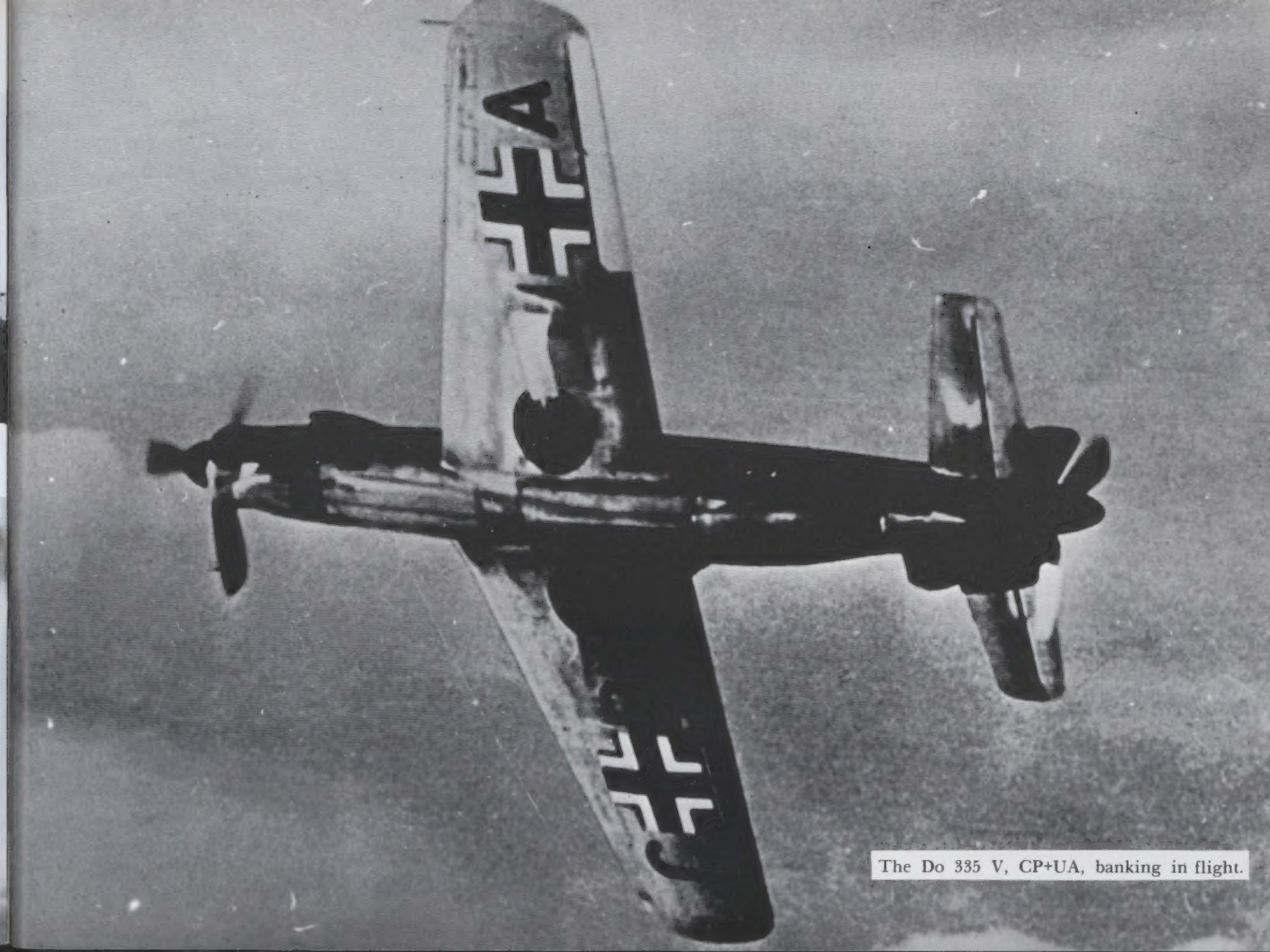
Meanwhile, the Do 335 V 1, CP+UA, had rolled out of the factory and began its first flight from Mengen, Württemberg, on October 26, 1943, under the direction of Flight Captain Dieterle. Despite minor teething troubles, such as every new type shows, the machine was convincing. The General of the Battle Flyers, Major General Peltz, and Colonel Petersen of the Rechlin Development Office, were impressed. Milch, who continued to plead for the construction of the Do 335, called attention in a communication to the Air Chancellery in November of 1943 to the Do 335's being capable to carry a 1000-kg payload as a high-speed bomber, while the Me 262 could carry only 500 kg.

Test pilot Dieterle.

The Do 335 V 1 landing.

The Do 335 V 1 in flight.



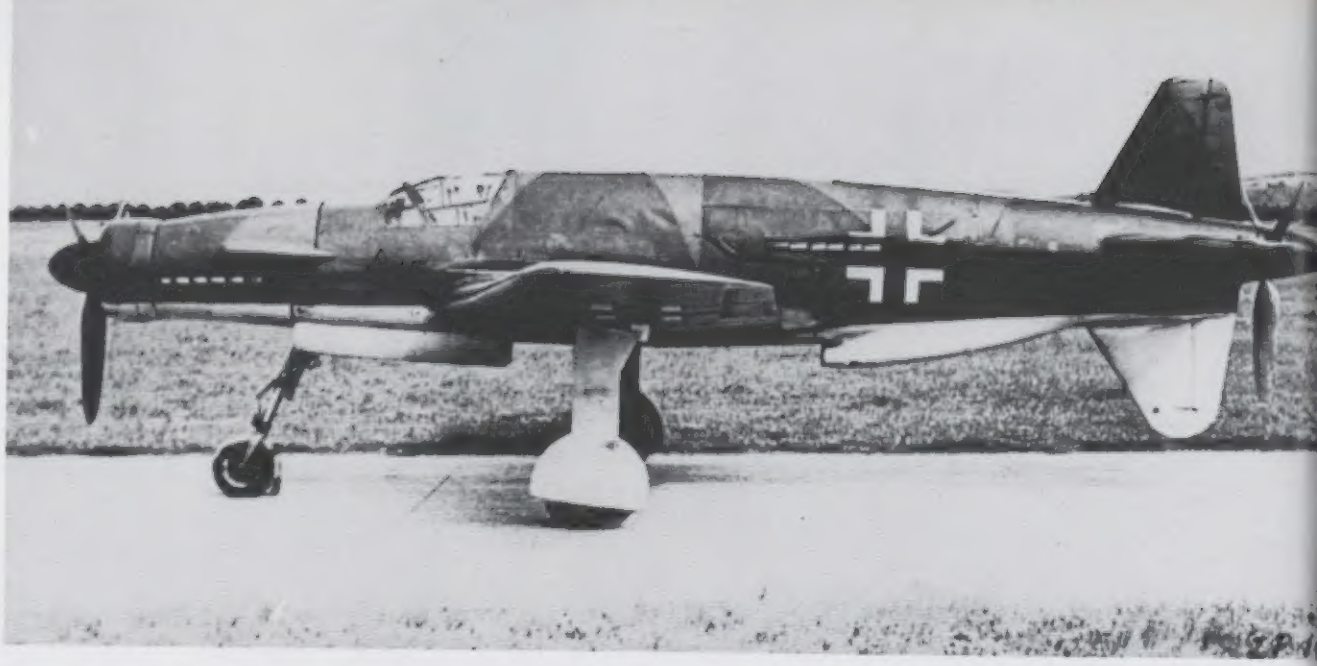


The Do 335 V, CP+UA, banking in flight.

On the basis of the Do 335's superior speed of 640 kph near ground level, 14 test machines, ten pre-series machines A-O, eleven Do 335 A-1 and three training planes were contracted for. At the same time the Do 335 V 2, CP+UB, went into testing and gave even better results than the V 1.

Of course Hitler was still more in favor of the Me 262 and Ar 234, as they were jet-powered, but decided that the Do 335 should be held in reserve, since the failure of the jet planes could not be ruled out. In a discussion between General of the Pursuit Flyers Galland, Colonel Knemeyer and Diesing of Rechlin, and Director Reidenbach of Dornier, Knemeyer requested that the high-speed bomber and destroyer versions should be as similar as possible in modular terms, in order to have both versions attainable at all times, if necessary, by making slight changes, such as a GM-1 (fuel injection) installation. Galland requested additional MK 103 wing armament for the destroyer. This was tested with dummies in the Do 335 V 2 and led to the V 13, the first model plane of the planned B Series.

In May of 1944, under the direction of Captain Schreiweis, former commander of the III./KG 2, a Do 335 testing command was established. The pilots intended for it were trained under the direction of Dornier factory pilots Dieterle and Padell. The Do 335 V 3, CP+UC, differed from the two forerunners mainly in having the oil cooler, formerly mounted under the annular radiator, included in the radiator itself. The plane was unarmed but was equipped with an Rb 50/30 serial camera and flew with the new identification T 9+ZH for the Long-Distance Reconnaissance Group ObdL (Commander of the Luftwaffe).



The Do 335 V 3 (CP+UC) with its new designation T9+ZH of Reconnaissance Group (F) ObdL.

Above: the Do 335 V3 seen in three-quarter view from the front.

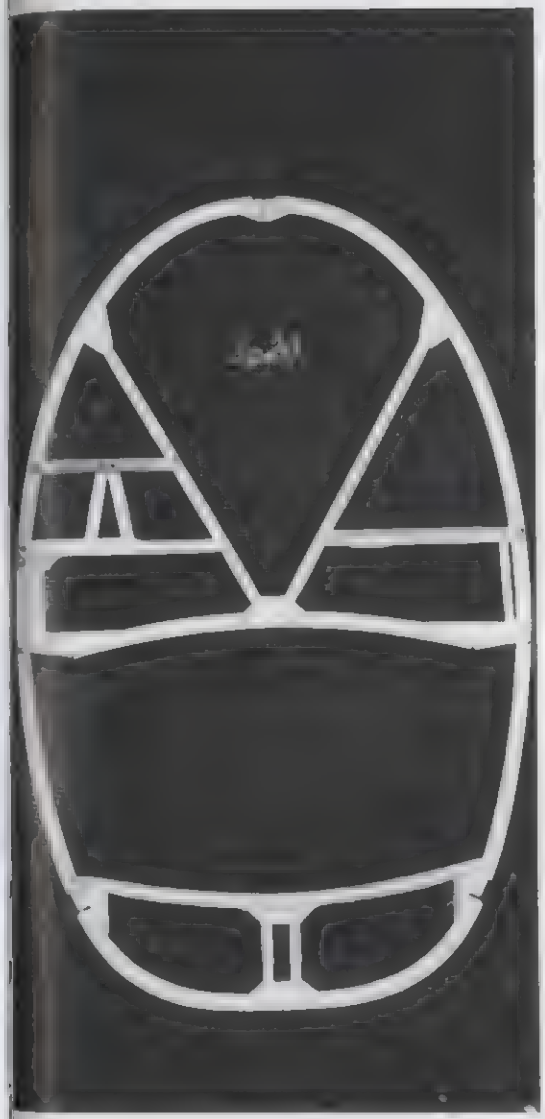
Below: The Do 335 V3's landing flaps.

Above: The Do 335 V3 from the front.

Below: The Do 335 V3's tail and pusher propeller.

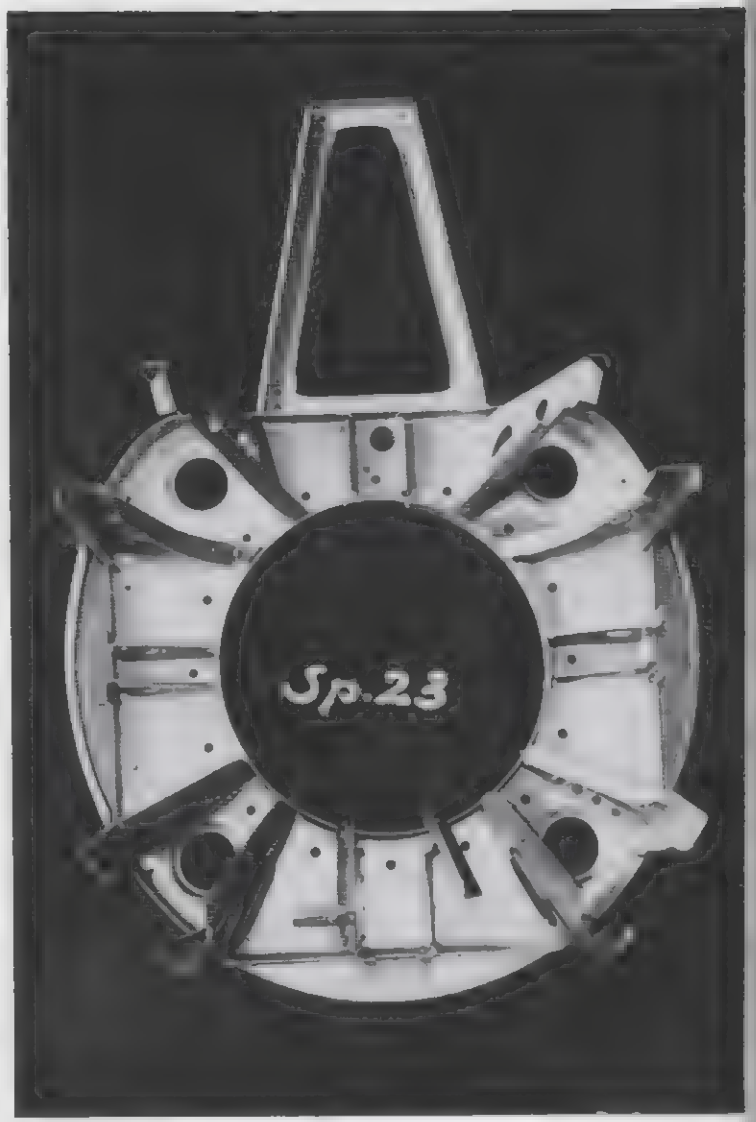
Tail constuction of the Do 335 B-4.

The Do 335 V 4, CP+UD, was to serve as a model plane for the planned further development, the Do 435, which had been developed from the P 232/2. The Do 335 V 5 was first to receive the planned armament of one MK 103 (30 mm) and two MG 151/20, plus cargo carriers for various bomb loads up to a total weight of 500 kg. The machine with the designation CP+UE was sent to the Weapons Proving Ground at Tarnewitz. On May 23, 1944 even the greatest optimist had to come to the realization that the expected Allied invasion was not to be turned back with the already built Me 262 and Ar 234. When Pursuit Program Chief Saur presented the actual production figures to Hitler, the latter ordered the Do 335 built in series as a high-speed bomber, as quickly and as many as possible. In early June he was informed that the completion date of the Do 335 was, for the time being, not predictable. Thereupon he ordered the production of this plane to proceed at all costs. A corresponding order was given by Hitler on July 7, 1944. When several planes were tested in Mengen, Württemberg, there were repeated difficulties, especially involving overheating of the rear engine, but there was no doubt of the plane's readiness for service. To divert the Allied air forces, already dominating much of the German air space, a false airfield had been laid out in the neighborhood of Mengen, which often fulfilled its purpose when American pursuit bombers came in at low altitudes. The full equipment of the III./KG 2 could not be carried, as not enough Do 335 planes were available, and the pilots intended for them had meanwhile been transferred. Those available were often driven back, especially in night attacks.



Rear frame No. 20.

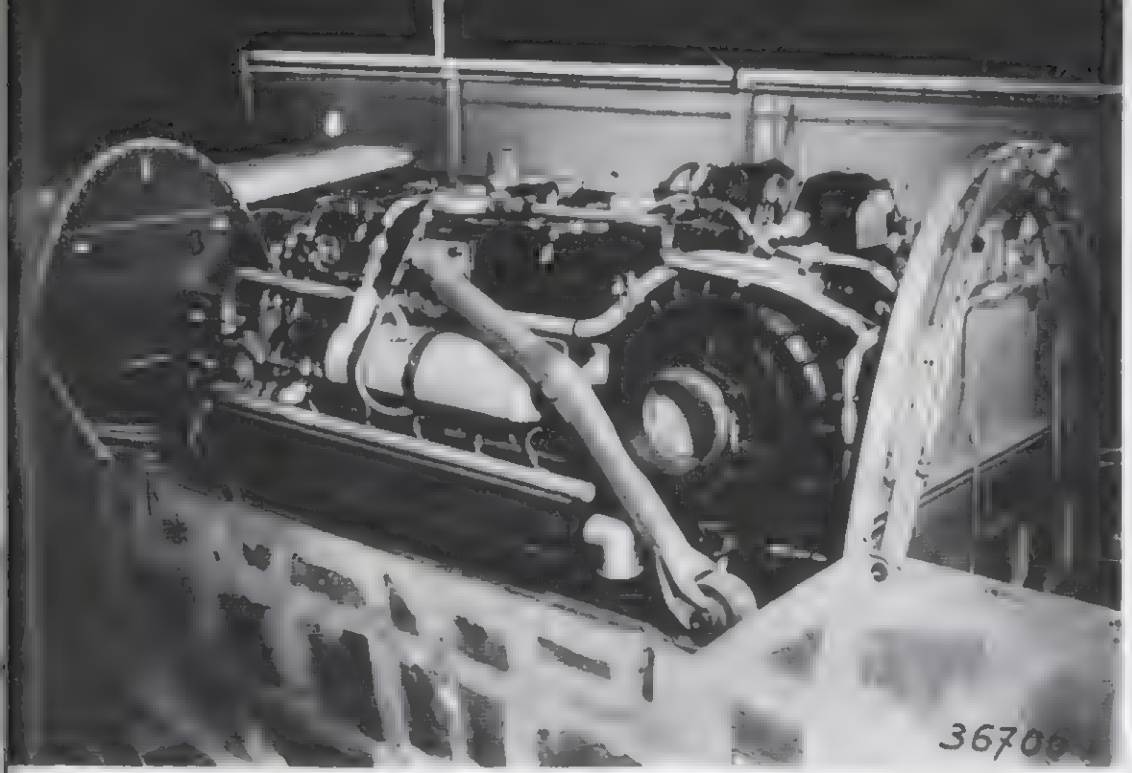
Rear frame No. 21.



Rear frame No. 23.

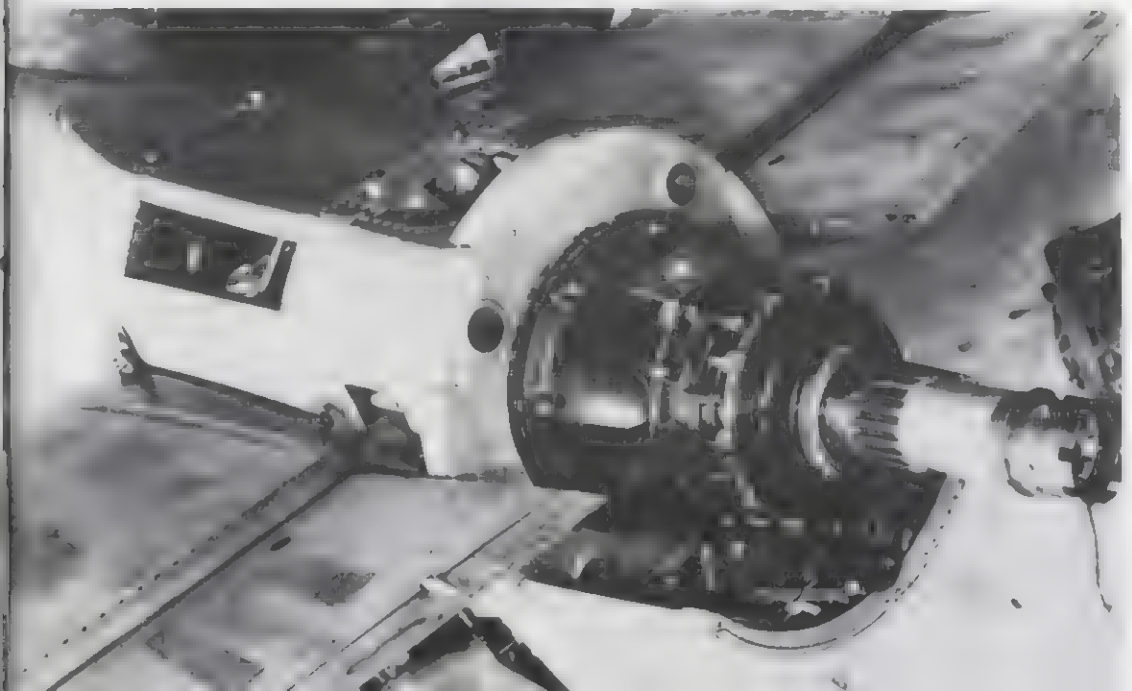
Do 335 V6, CP+UF, was used by Dornier as a factory plane at that time for testing changes ordered by Testing Command 335. Do 335 V7, CP+UG, was turned over to Junkers at Dessau and served there as a flying test bench for the high-performance Jumo 213 E. motor. At this time plans were made to begin series production of the destroyer version in December of 1944, with the DB 603 E or LA motor. For testing with these powerplants, Do 335 V8, CPO+UH, was sent to Daimler-Benz. Do 335 V9, CP+UI, then became the beasic model for the final version of the Do 335 A-O or A-1. Around this time—it was already the Autumn of 1944—A Do 335 was damaged and forced to land near Rheims by the Allies. It is possible that this was V3, which was already in service as a long-distance reconnaissance plane.

Do 335 V9, CP+UI, became the basic model for the Do 335 a series.



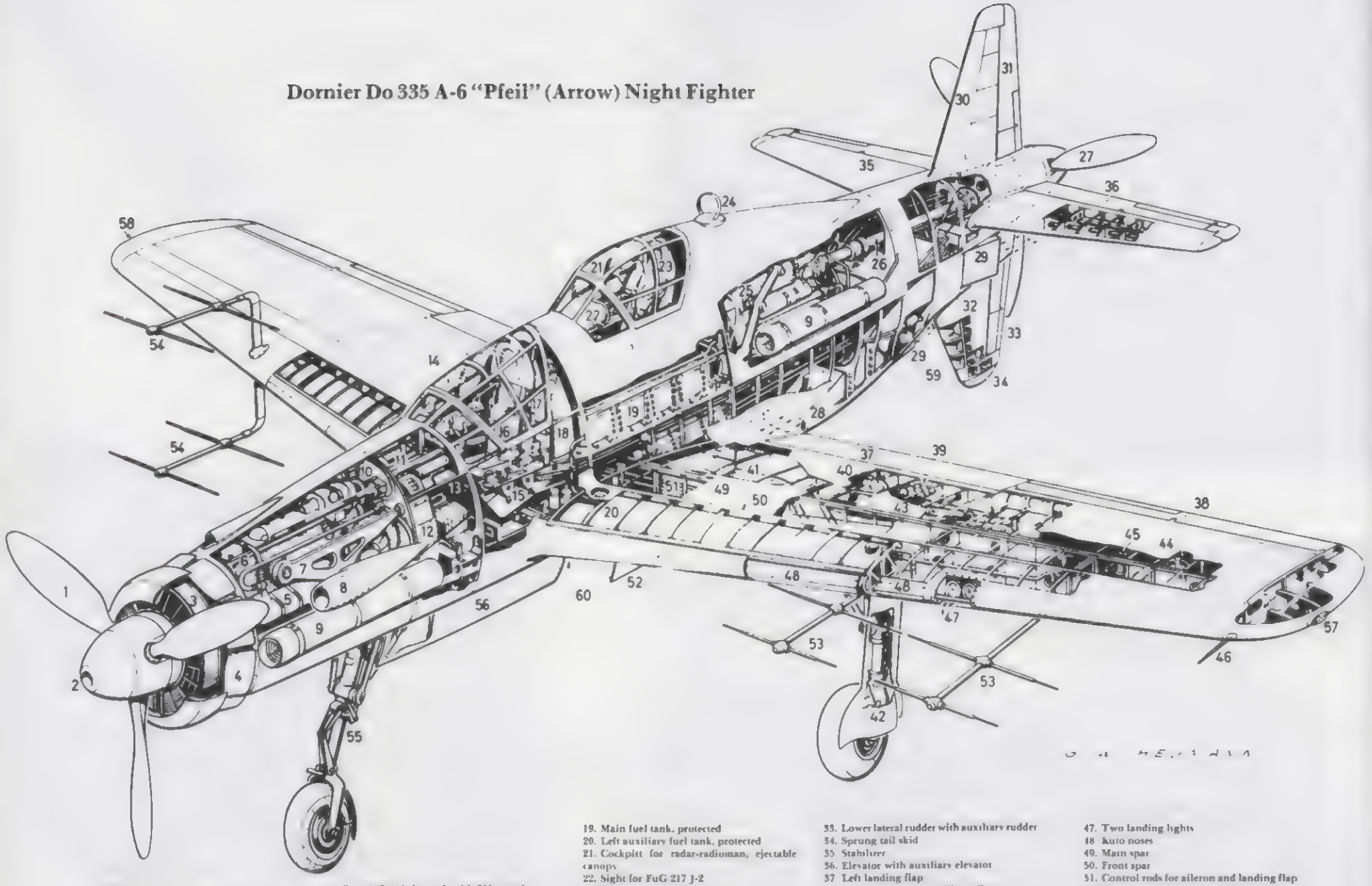
Above: Daimler-Benz DB 603 installed as the rear engine.

Do 335 with remote-control DB 603 motor.



The rear propeller of the Do 335 A-O.

Dornier Do 335 A-6 "Pfeil" (Arrow) Night Fighter



1. Pulling propeller
2. Mouth of the MK 103 shooting channel
3. Armored front radiator
4. Regulating flap for air escape
5. Coolant reservoir, 15 liters (2 per motor)
6. DB 603 E-1 motor (1800 HP)
7. Motor mounting
8. Air intake for supercharger
9. Exhaust flame extinguisher
10. Fire wall
11. Two MG 151 15, each with 200 rounds
12. Ammunition canister for machine guns
13. One Mk 103 (30 MM?) with 70 rounds
14. Cockpit for pilot, raising canopy
15. Control stick, gas pedal and left bank of controls
16. Catapult seat, heavily armored
17. Rear armor
18. Left lubricant reservoir, 102 liters, armor-protected
19. Main fuel tank, protected
20. Left auxiliary fuel tank, protected
21. Cockpit for radar-radioman, ejectable canopy
22. Sight for FuG 217 J-2
23. Armored radioman's seat
24. Frame antenna for FuG 25a
25. DB 603 E-1 rear motor (1800 HP)
26. Long driveshaft to rear propeller
27. Pushing propeller (ejectable)
28. Coolant shaft for rear powerplant
29. Cool air escape flaps
30. Upper vertical fin (ejectable)
31. Upper lateral rudder with auxiliary rudder
32. Lower vertical fin, ejectable
33. Lower lateral rudder with auxiliary rudder
34. Sprung tail skid
35. Stabilizer
36. Elevator with auxiliary elevator
37. Left landing flap
38. Left aileron with auxiliary aileron
39. Compressed-air bottles (ball battery)
40. Protected pressurized oil reservoir (20 liters)
41. Well for left landing gear
42. Left main landing gear
43. Activating cylinder for landing gear.
44. Main compass
45. Control line for aileron operation
46. Pressure jet
47. Two landing lights
48. Auto noses
49. Main spar
50. Front spar
51. Control rods for aileron and landing flap
52. Bomb bay (here space for auxiliary container)
53. Antennae for FuG 217 J (left & right)
54. Antennae for FuG 217 J (up and down)
55. Bow landing gear
56. Bow wheel well hatch
57. Port navigation light
58. Starboard navigation light
59. Rear light
60. Lights behind bow wheel shaft

At this time an intensive discussion was in progress among the various Luftwaffe agencies about the introduction of a Do 335 night fighter and its armament. The Do 335 V 10, CP+UK, was intended to be the prototype. It was to serve once as the carrier of the X-4 air-air rocket, after which the MK 114 was to be installed instead of the MK 103. This was a cannon of 55-mm caliber, which was to have a firing speed of 150 rounds per minute and a maximum range of 2000 meters. For this weapon the Air Ministry required a maximum weight of 1000 kg. But since Rheinmetall-Borsig could not make it lighter than 1265 kg, the development was halted. The Do 335 V 10 was rebuilt into a night fighter at Heidfeld, near Vienna, since Heinkel of Vienna was to produce the plane in series.

Heinkel, though, was overburdened with series production of the He 162 "Volksjäger", and the rebuilding could not be completed in time. In particular, the necessary navigational instruments could not be obtained in time. On January 24, 1945 the Do 335 V 10 was sent to the night-fighting equipment proving ground at Werneuchen. But since the Russians were already at the border of the Neumark at this time, the proving ground was moved to Stade. There the FuG 218 "Neptune" was to be built in. But since Dornier could not deliver it on time, on account of difficulties caused by the war situation, the night-fighter version of the Do 335 A-6 was cancelled.

Dornier Do 335 A-1, factory number 240105, at Oberpfaffenhofen.

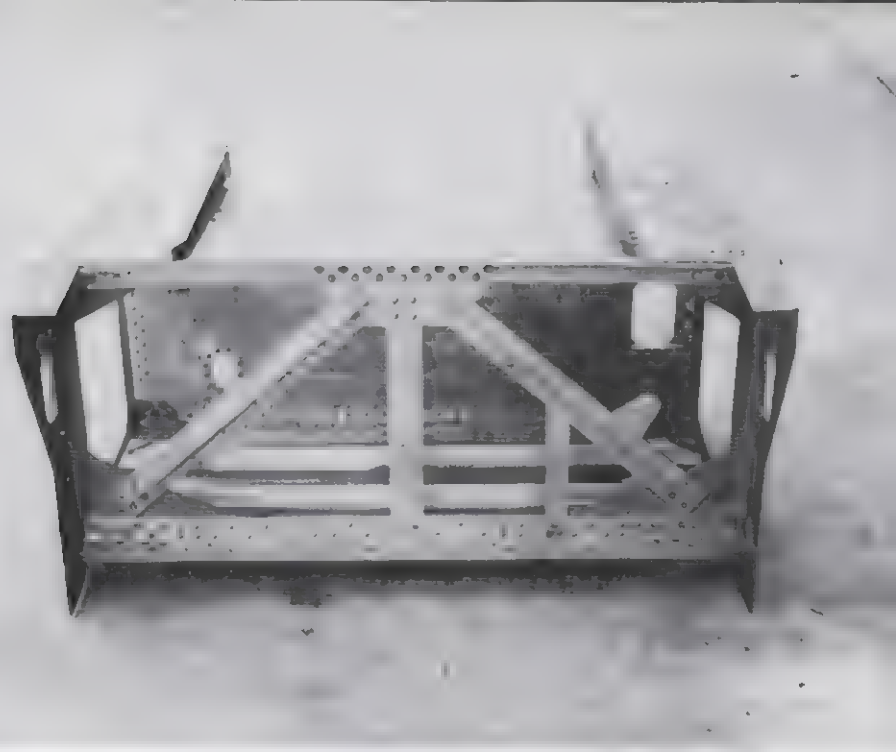
The Dornier Do 335 A-1, factory number 240107.

Above: The boarding ladder was extended and retracted by a hand crank mounted above the wing.

Upper right: The Do 335 A-1, factory number 240107.

Right: Do 335 A-) of Service Command 335 in Mengen, 1944.

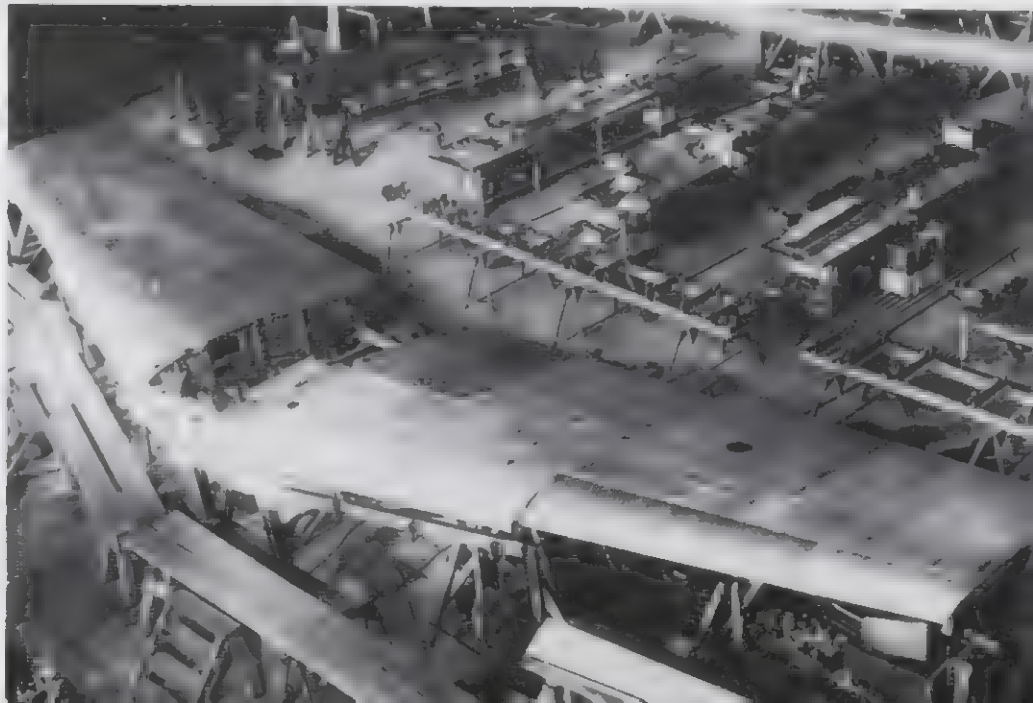
Above: Rear wing connector unit.

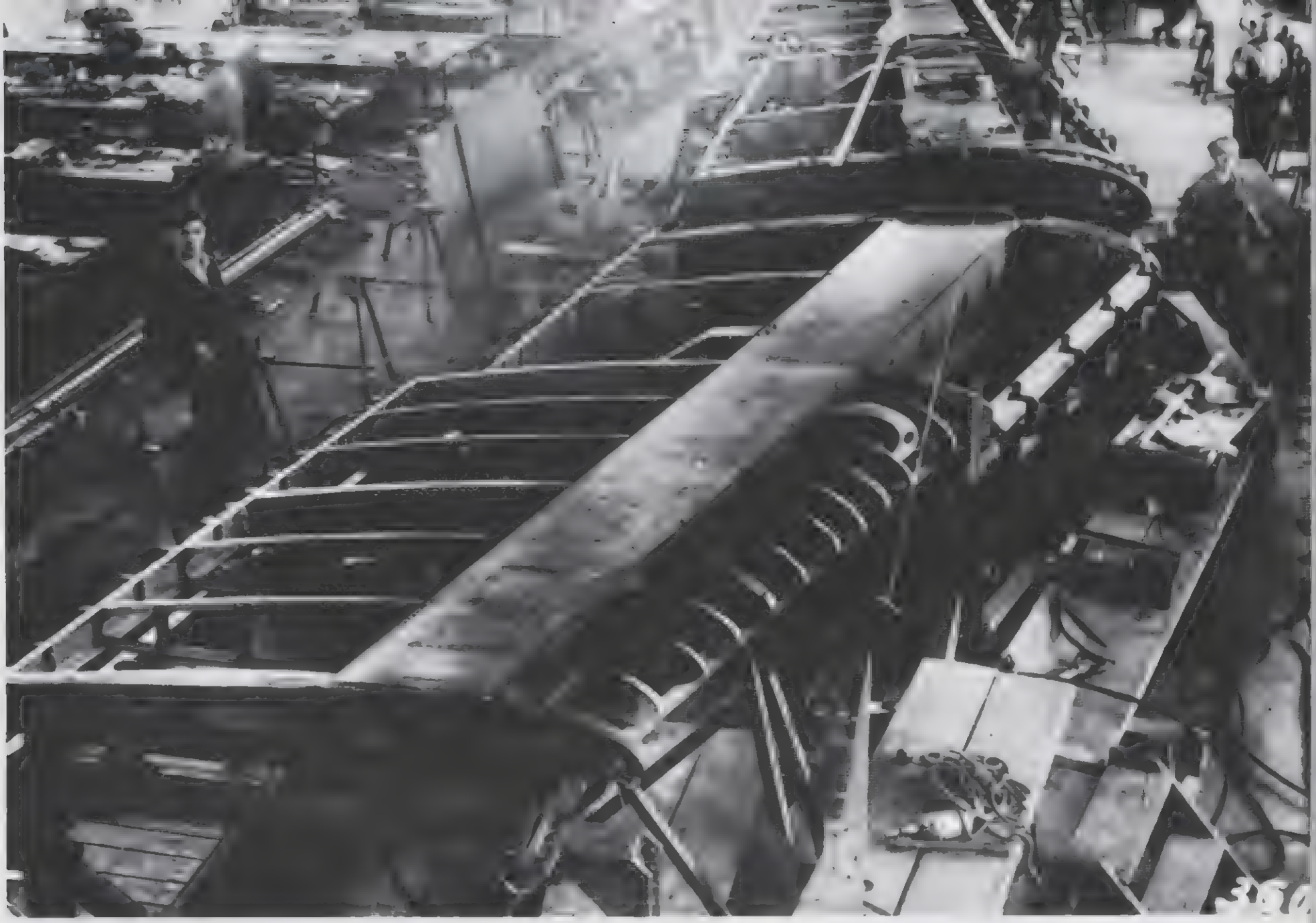


Above: Another view of the same connector unit.

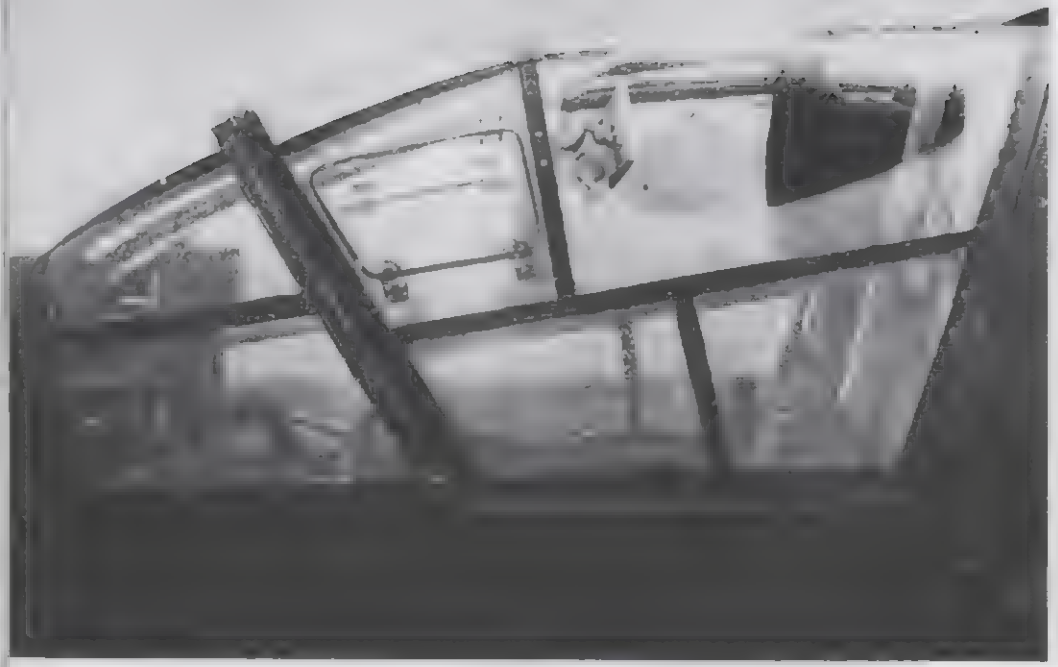
Below: Wing box spar.

Below: The wings under construction.





The wings under construction.

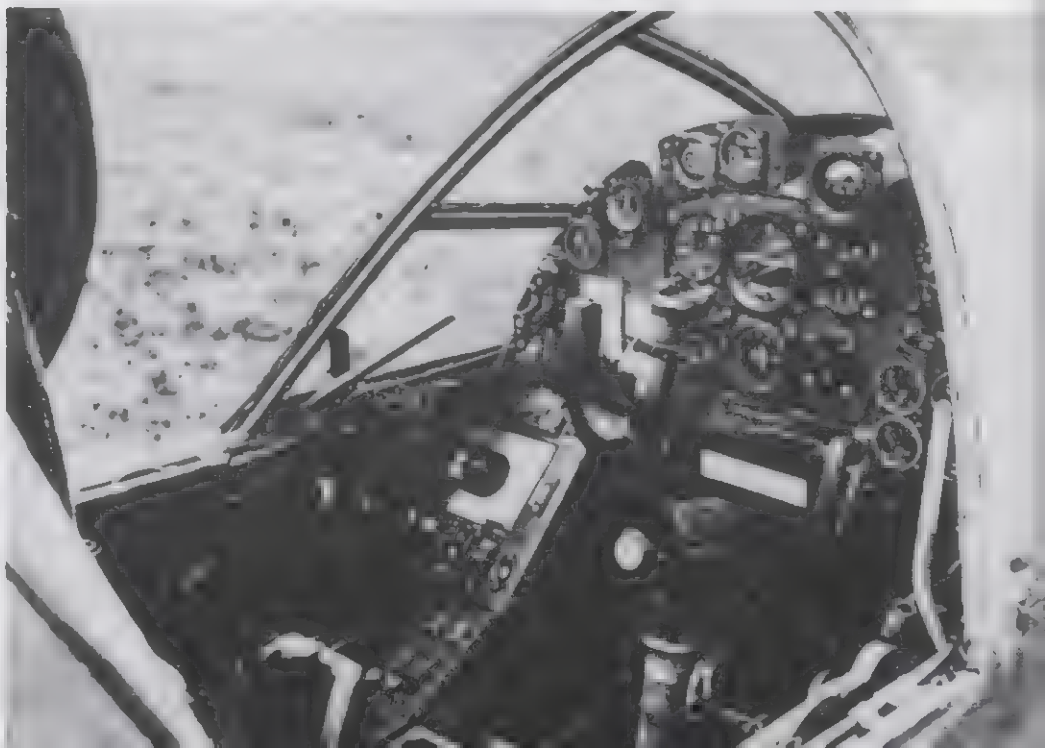


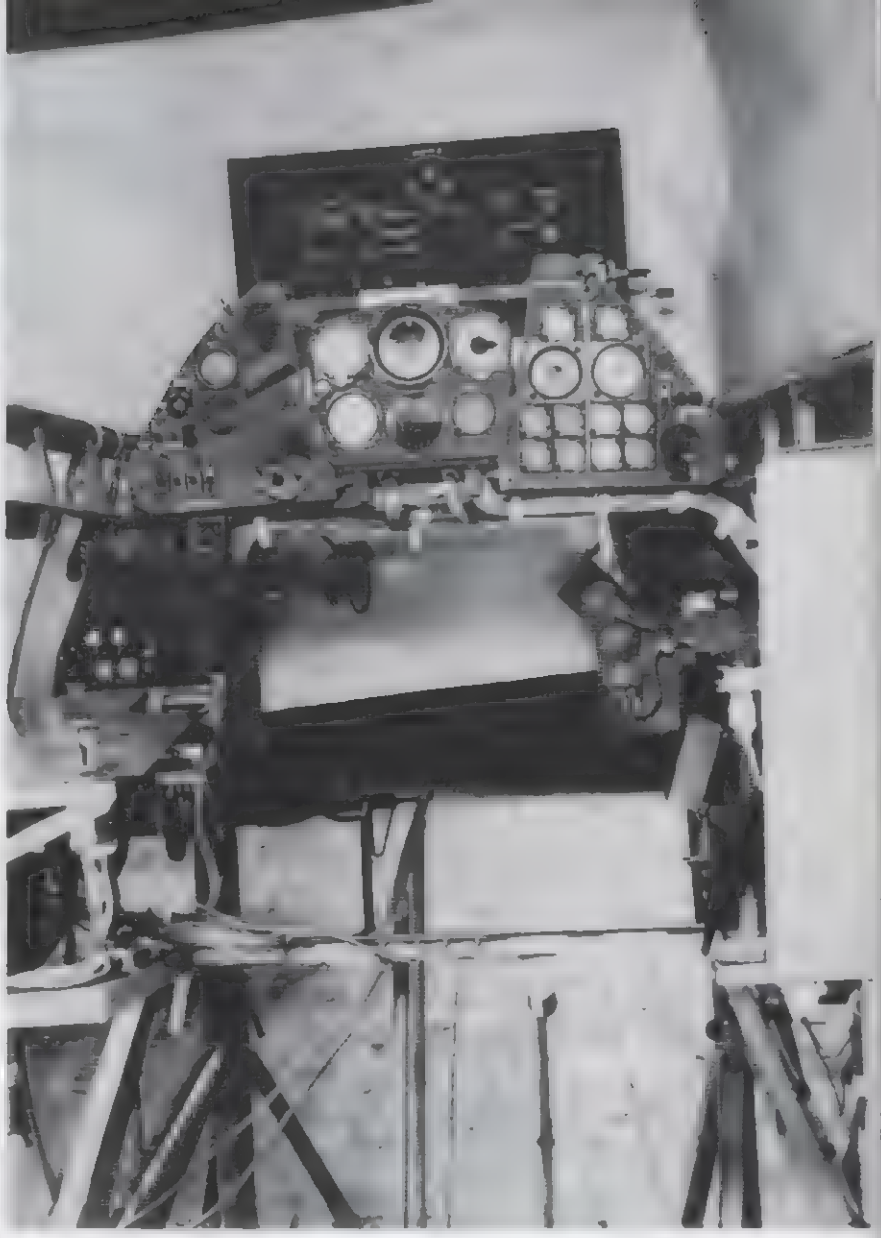
Above: The cockpit from outside after rain testing.

Below: The cockpit with the instrument panel.

Above: Diagonal exterior view of the cockpit.

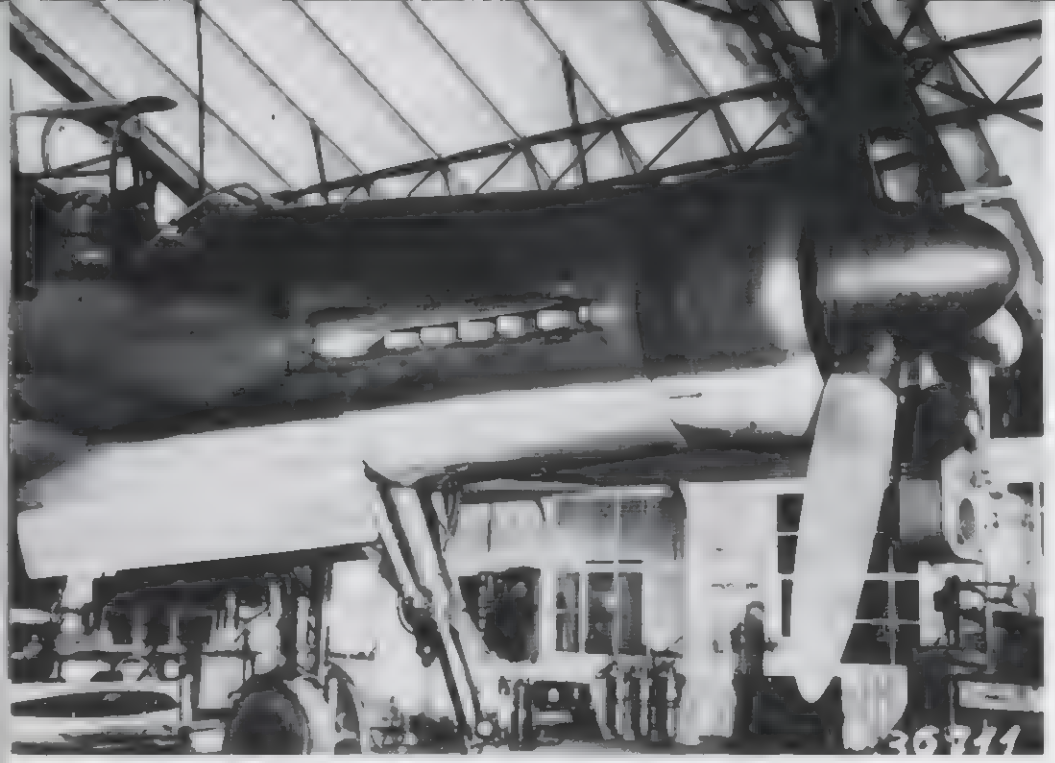
Below: The same from the other side.





Above:
A dummy of the instrument panel.

Left and upper left:
Complete equipment for the cockpit and part of the instrument panel.

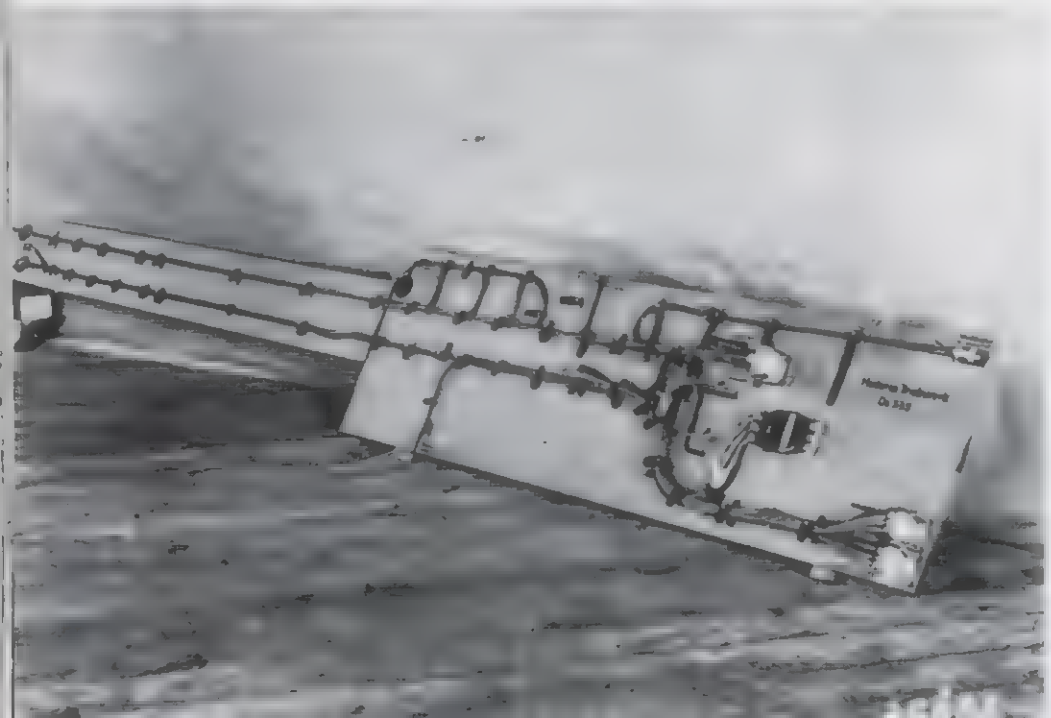


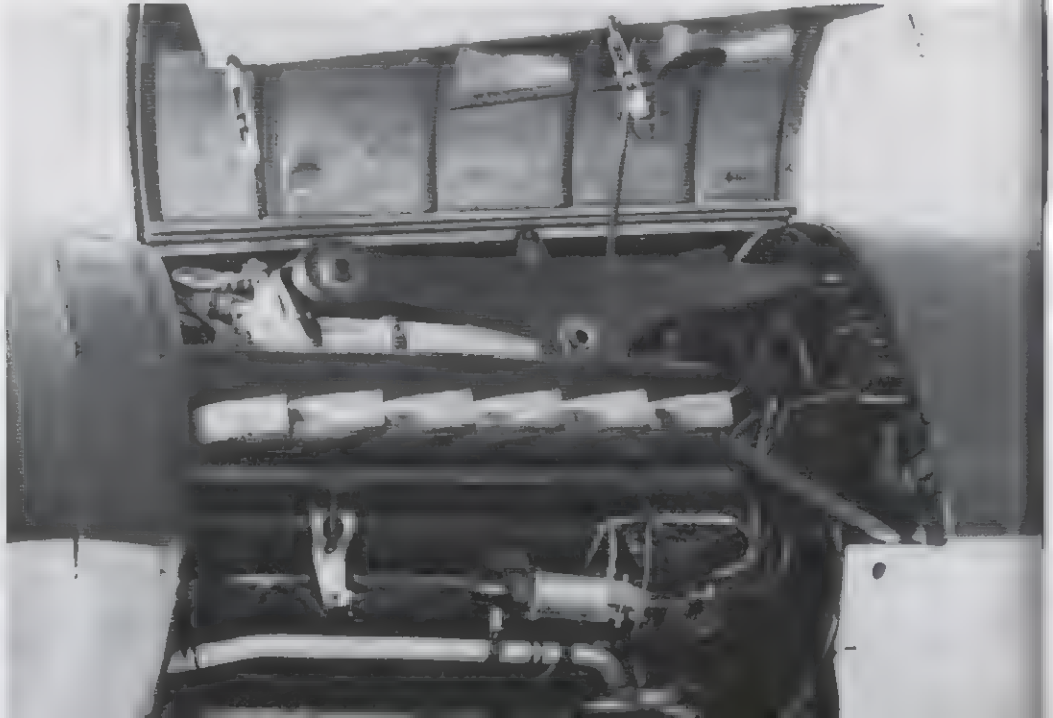
Above: The Daimler-Benz 603 rear engine.

Below: Electric system for the rear engine.

Above: Rear control surfaces and propeller.

Below: Installation of the front DB 603 engine.

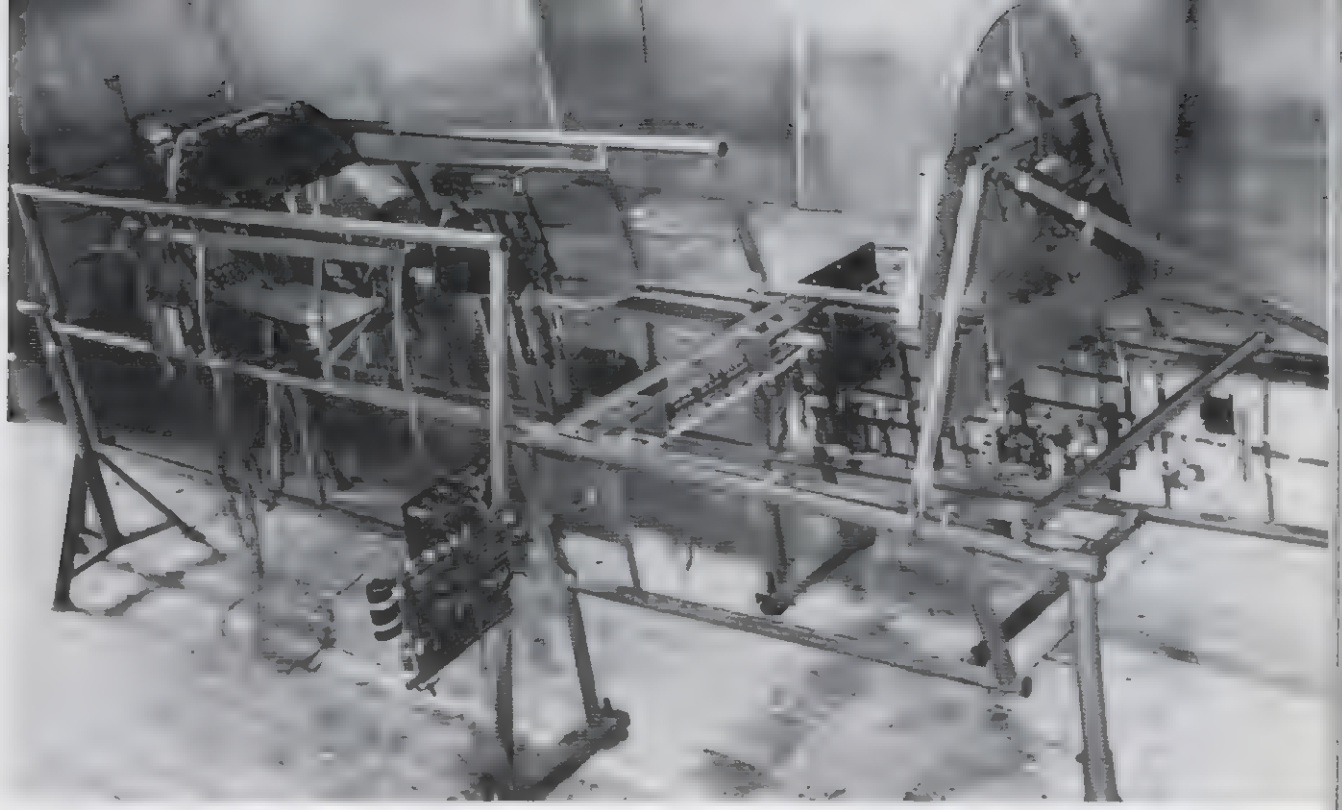


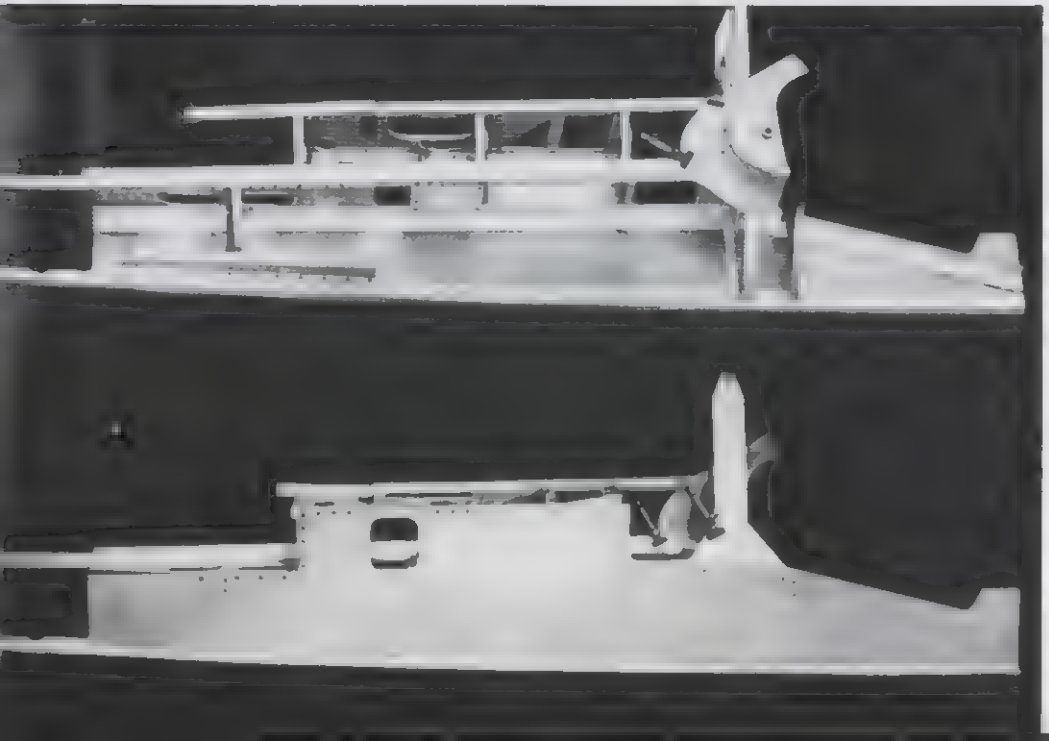


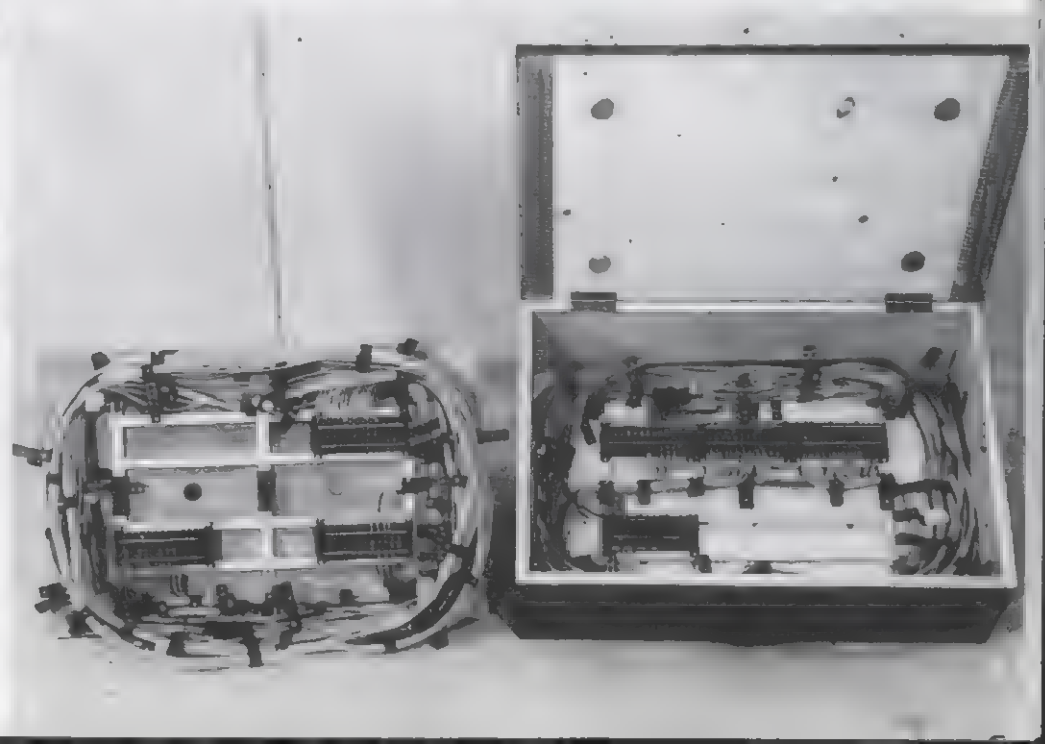
Right:
Rear mount for the electrical system.

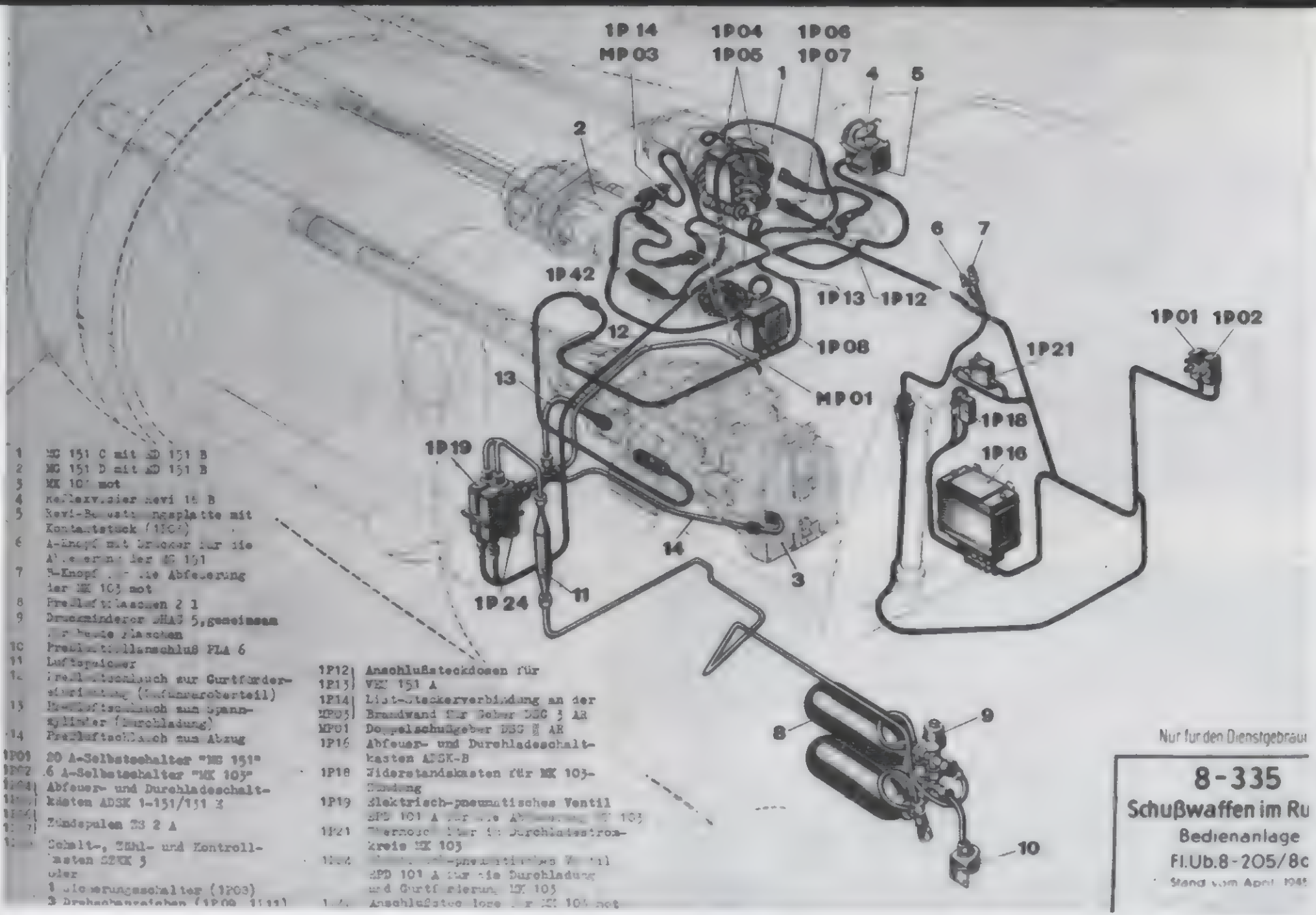
Lower right: Completed cables with distributor case.

Below: Lateral rear longitudinal frame to which the control surfaces were connected.









Weapons system of the Do 335 A.

Landing gear: bow wheel.

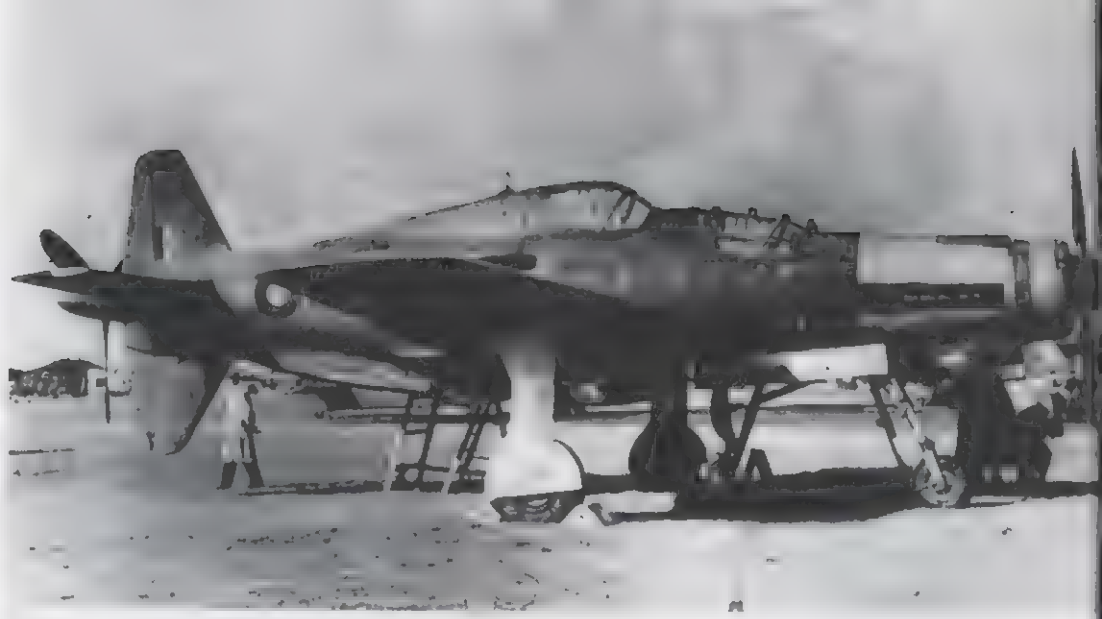
Landing gear: right main wheel.

By this time, additional test planes had been finished. Do 335 V 11, CP+UL, and V 12, CP+UM, basically curresponded to the V 10, but were unarmed, since they were planned as training planes. They remained the only representatives of the V 10 series. Do 335 V 3 can be regarded as a basic design for the A-4 reconnaissance version, and V 10 for the A-6 night fighter. A-6 and A-10 were two-seaters.

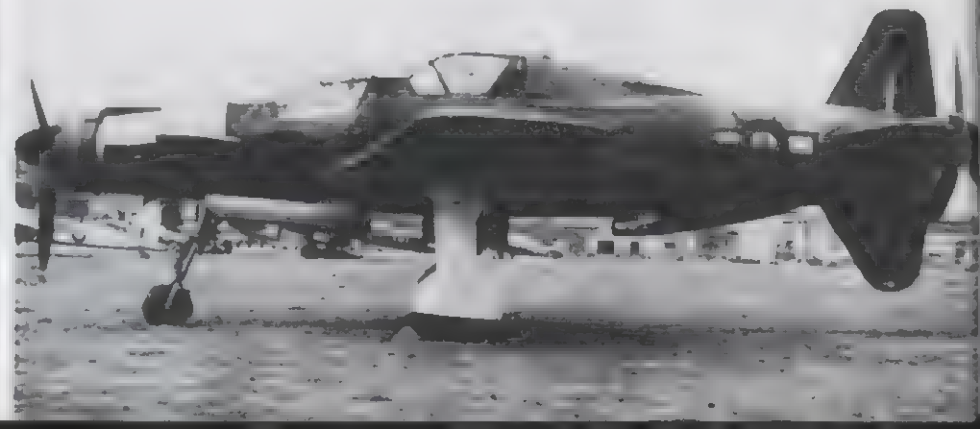
A second trainer version was the A-12. While A-10 was developed from the A-0 pre-series, A-12 was a rebuilding of A-1. This series continued, to be sure, but only a few planes were finished. When the first American troops reached the Dornier works in Oberpfaffenhofen at the end of April, they found several A-1, four A-4 and several A-10 and A-12 planes there. Among them was the Do 335 A-12, factory number 240112. On September 7, 1945 it was flown to Rheims by the English Flight Lieutenant Taylor, and from there to Farnborough for a victory display by Squadron Leader McCarthy. A second plane, factory number 240121, was flown repeatedly by both English and American pilots, and then likewise sent to England. Factory number 240112 crashed in England on January 18, 1946, killing its pilot, Group Captain A. F. Hardest. Factory number 240121 was destroyed on December 13, 1945. Factory number 240122, which was found damaged at Oberpfaffenhofen, was scrapped.

Dornier Do 335 V 11, CP+UL, was the basic model for the A-10 series.

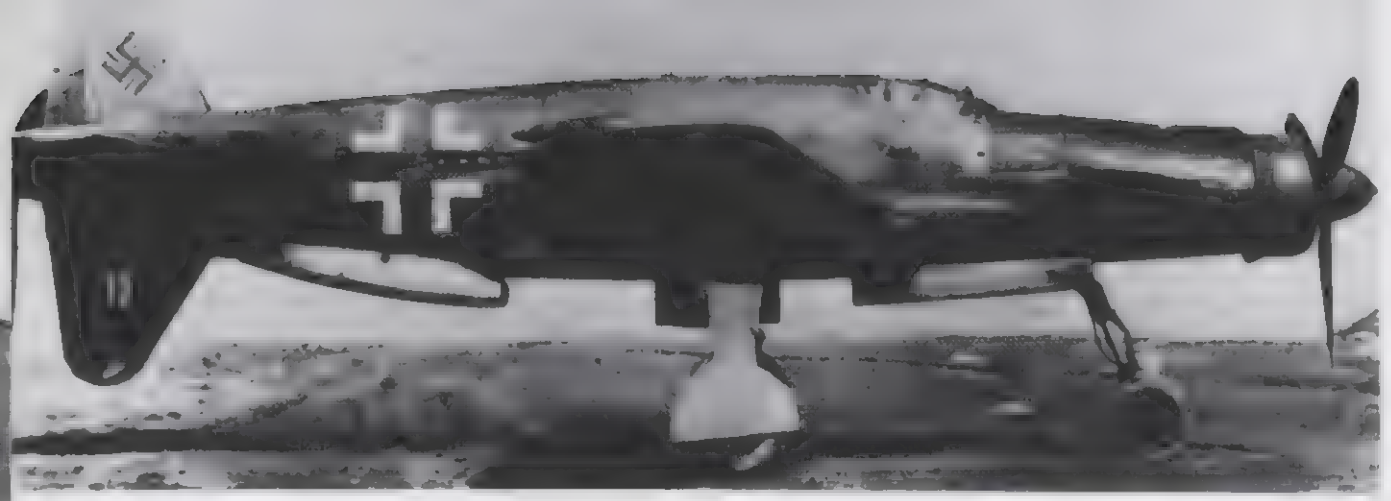
Dornier Do 335 A-12, factory number 240112, shortly after completion.



Do 335, factory number 240112: upper left, after the Americans arrived; the other pictures show the plane at Farnborough in 1946.



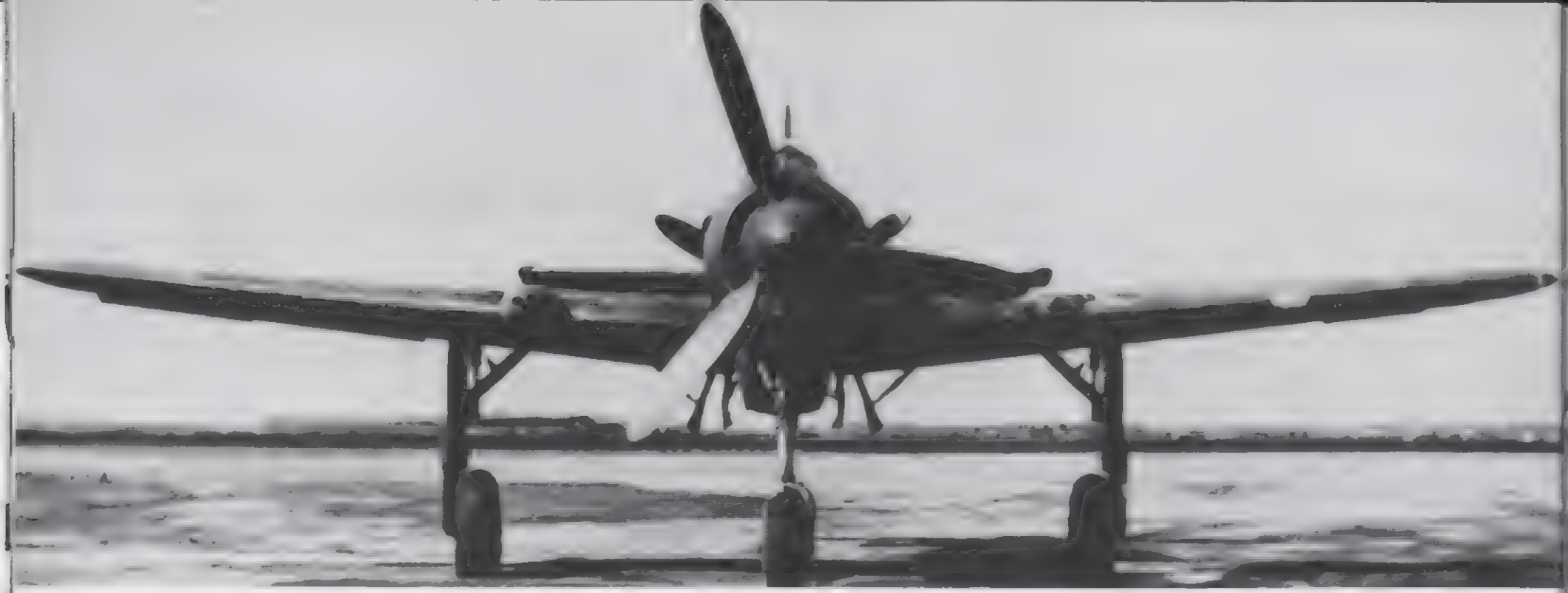
The Dornier plant in Oberpfaffenhofen after American occupation.



Dornier Do 335 V 13. RP+UA, was the basic model for the B series.

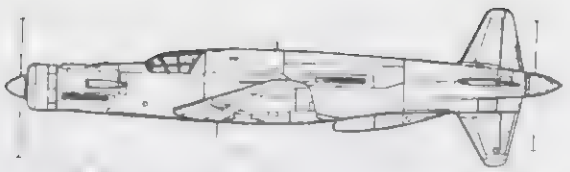
The Do 335 B series differed from the A series mainly in its wing armament, which consisted of two MK 103 guns. A further development was the B-4 version, which had an increased wingspan of 18.40 meters and was intended as a high-altitude destroyer. Apparently only two or three planes of the B series were finished. They were Do 335 V 13, RP=UA, and V 14, RP+UB, and a B-6, a planned night-fighter version. These three planes fell into French hands. The aforementioned B-6 seems to have been Do 335 V 17, RP+UE. Do 335 V 14 was completed by German mechanics under French supervision and taken to the Centre Experimentale de Voile in Bretigny, where it was often flown by Lt.Col. Roger Receveau. The B-6 already mentioned (V 17?) was destroyed at Bron, France in the autumn of 1945.

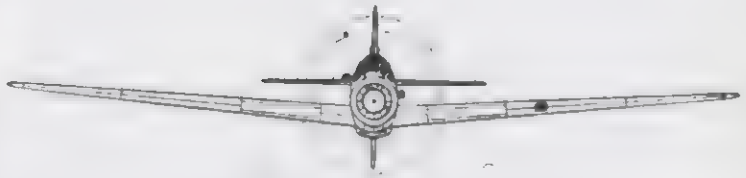
Dornier Do 335 V 13 was the first Do 335 with wing armament.

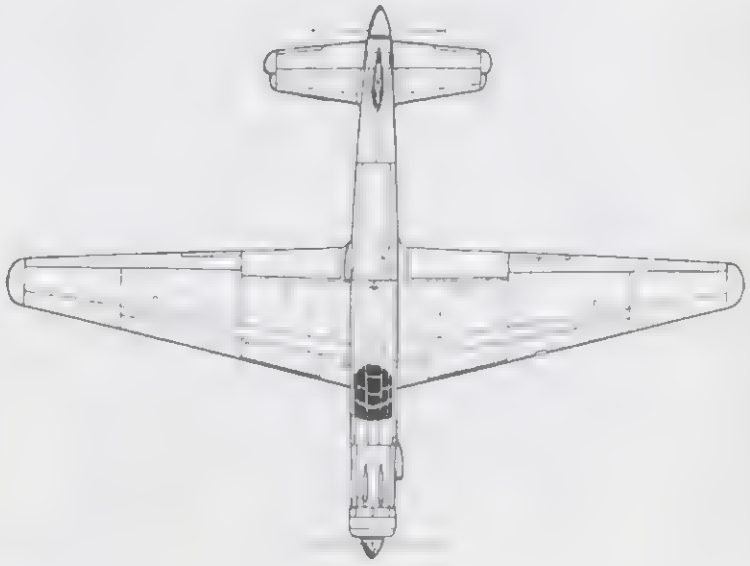


Do 335 v 14, RP+UB, during testing by Lt. Col. Receveau in Bretigny.

Additional pictures of Do 335 V 14 in Bretigny. The mounting of the wing cannons is clearly seen.



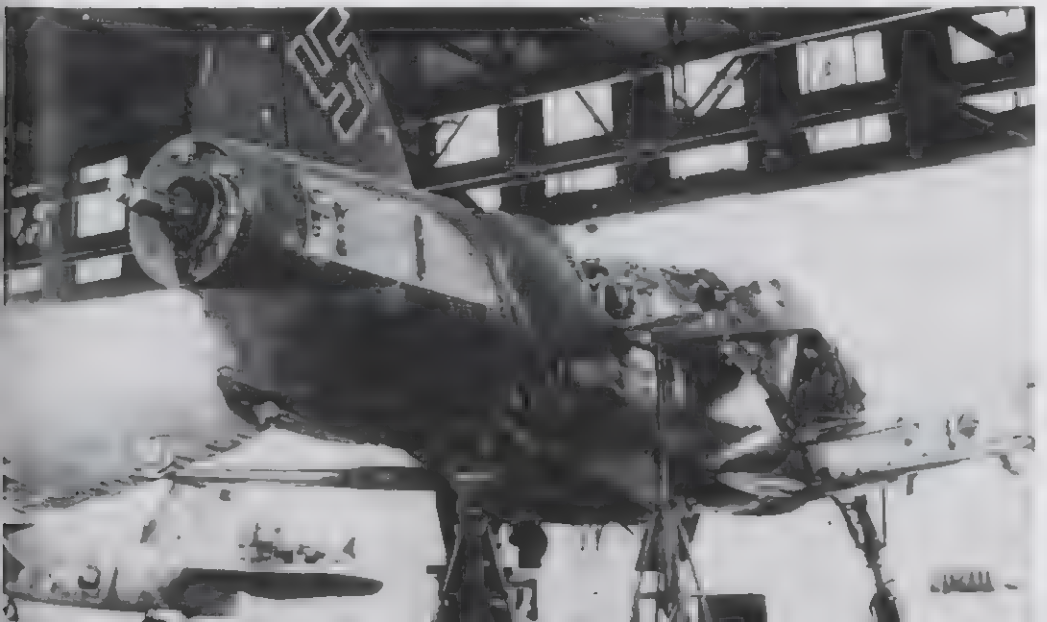




Three-way view of the Do 335 B-4.

Do 335 V 17, model for the B-6 series, after crashing at Bron in the autumn of 1945.

Thus did the Americans find what remained of Do 335 production at Oberpfaffenhofen in 1945. Here are three Do 335 A-1 and, at lower right, Do 335 A-12, factory number 240122.



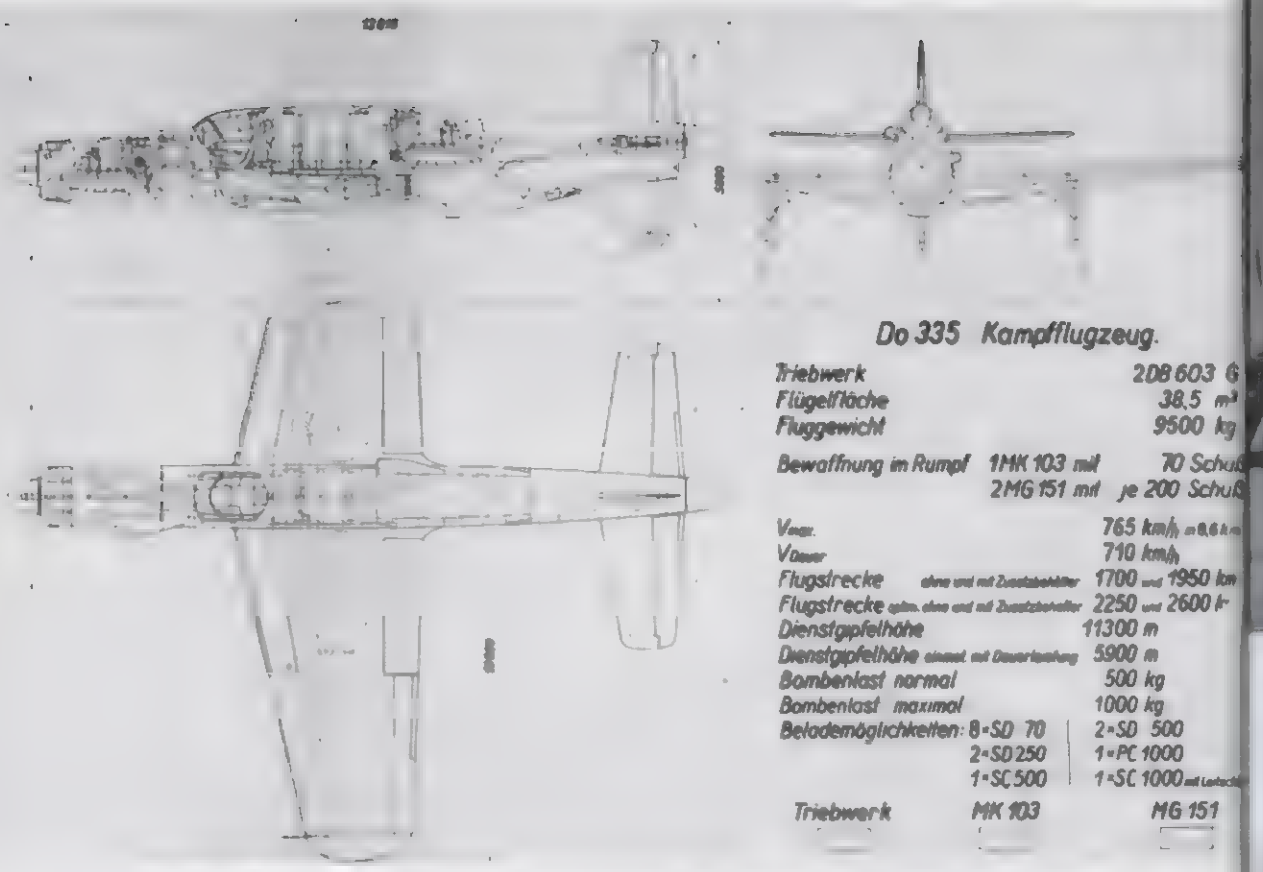
Do 335 A-1 with American markings. In front of it is the wreckage of a Heinkel He 162.

Right page: The Americans found these planes in the Oberpfaffenhofen factory in 1945.

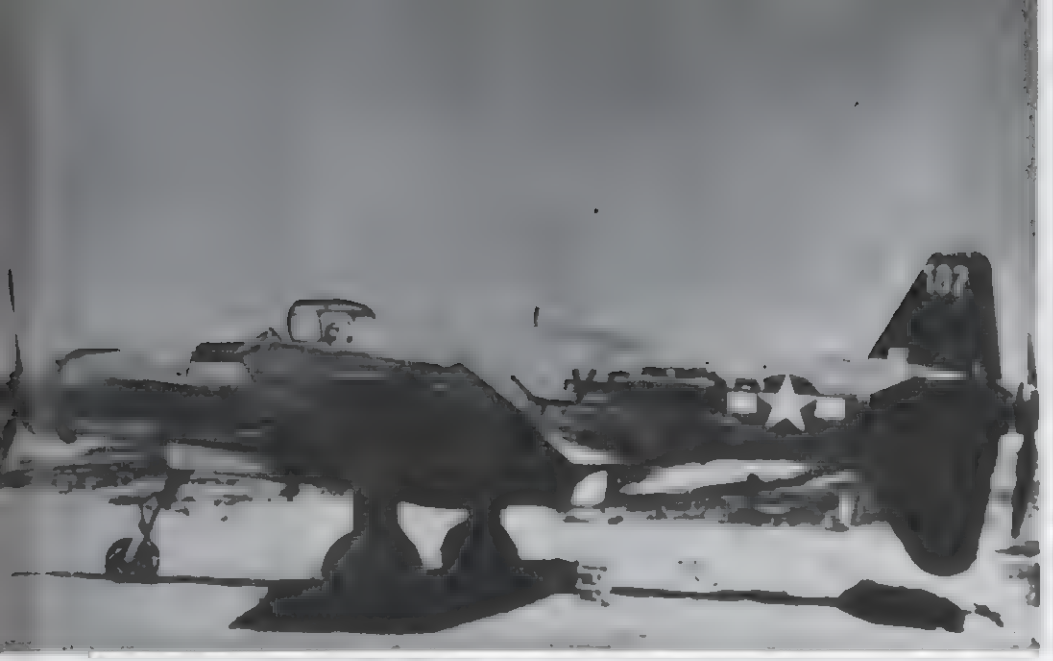

1418
16
20

By the war's end, Do 335 test planes V 1 to V 14, ten Do 335 A-0 with factory numbers 240101 to 240110, and three A-12 with factory numbers 240112, 240121 and 240122 had been built. Some 15 to 20 Do 335 planes were still under construction when the war ended. Two Do 335 A-0 or A-1 were taken to America on the aircraft carrier "Reaper" as part of US Operation "Seahorse" (protection of valuable German aircraft). There the plane numbered 240102, with designation VG+PH, had a varying fate. It was taken to Rechlin in the late fall of 1944. Shortly before the Russians took Rechlin, Air Chief Engineer Lerche moved the plane to Prague, Lager-Lechfeld and finally Oberpfaffenhofen. Then it was taken, as noted, to the USA on the carrier "Reaper" and arrived at the US Navy's Pawtuxet River Test Center. From there the plane moved to the National Air Museum/ Smithsonian Institution in Washington, D.C. Just two years after the German defeat, the plane was not wanted for display purposes and was sent to be stored at Silver Hill, where it slowly rusted away. Through private initiative and the help of Lufthansa, it became possible to move it to Germany on a B 747 F. At its home in Oberpfaffenhofen, the plane was then restored, to a great extent by volunteer work. The plane was displayed at the Hannover Air Show early in May of 1976, until its place in the German Museum in Munich was ready; there it remains today as an example of German creativity in aircraft building.

The following further developments planned by Dornier could not be realized:



Do 335 A-0, VG+PH, factory number 240102, before the Americans arrived.



Above: The same plane with American markings.

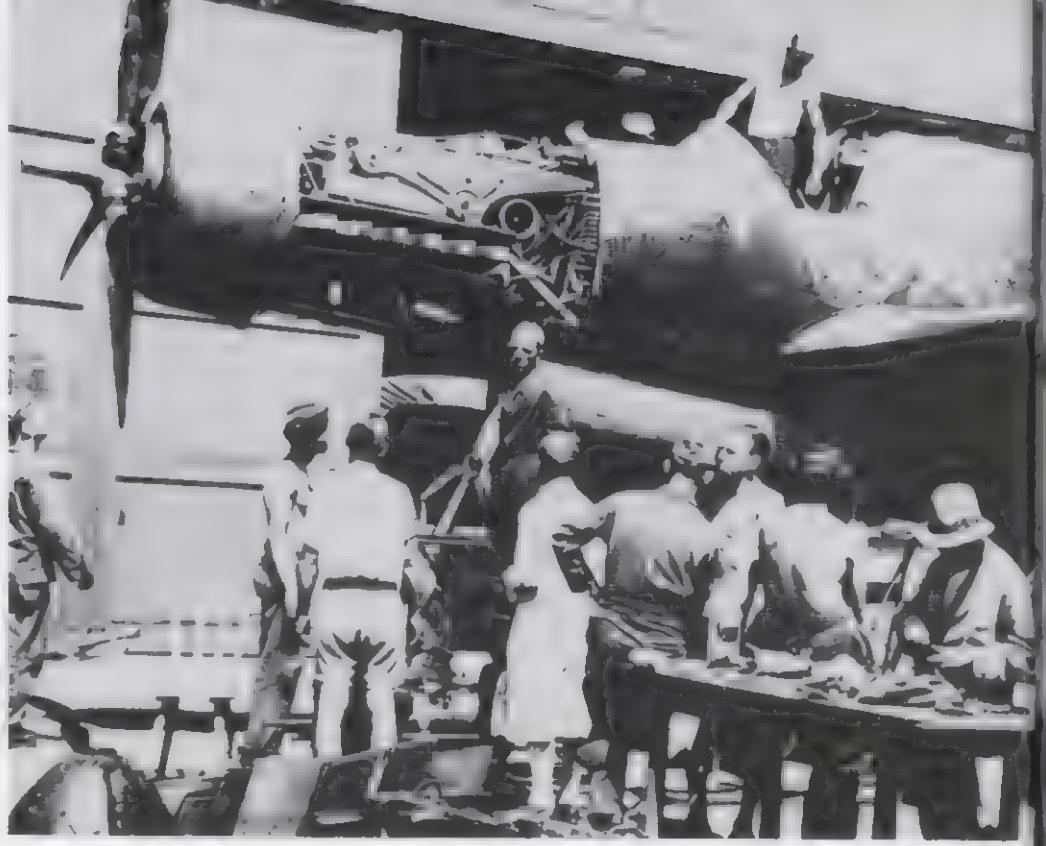
Above: Another view in the same condition.

Below: Do 335 A-0, factory number 240102, shortly before being removed.

Below: The same plane while being loaded onto the aircraft carrier "Reaper".

Arrival of Number 240102 at Oberpfaffenhofen on a West German Air Force Transall.

Number 204102 during restoration.



The restoration team at work.

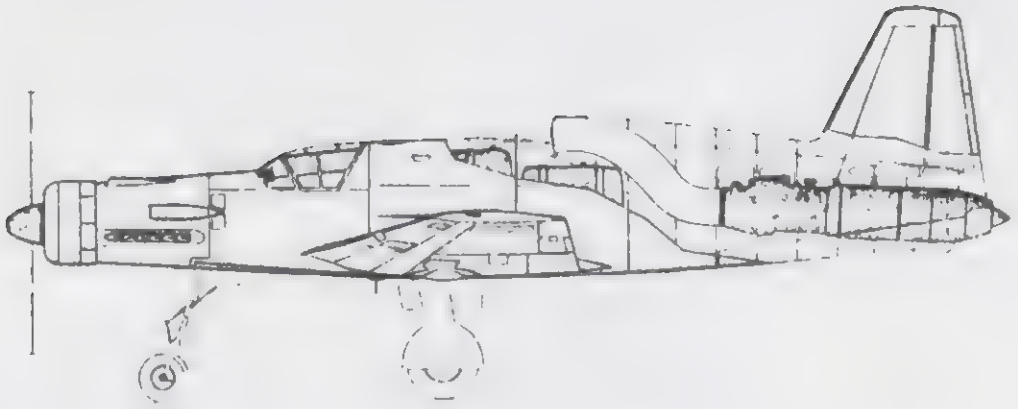
The same plane shortly before it was taken to the USA.

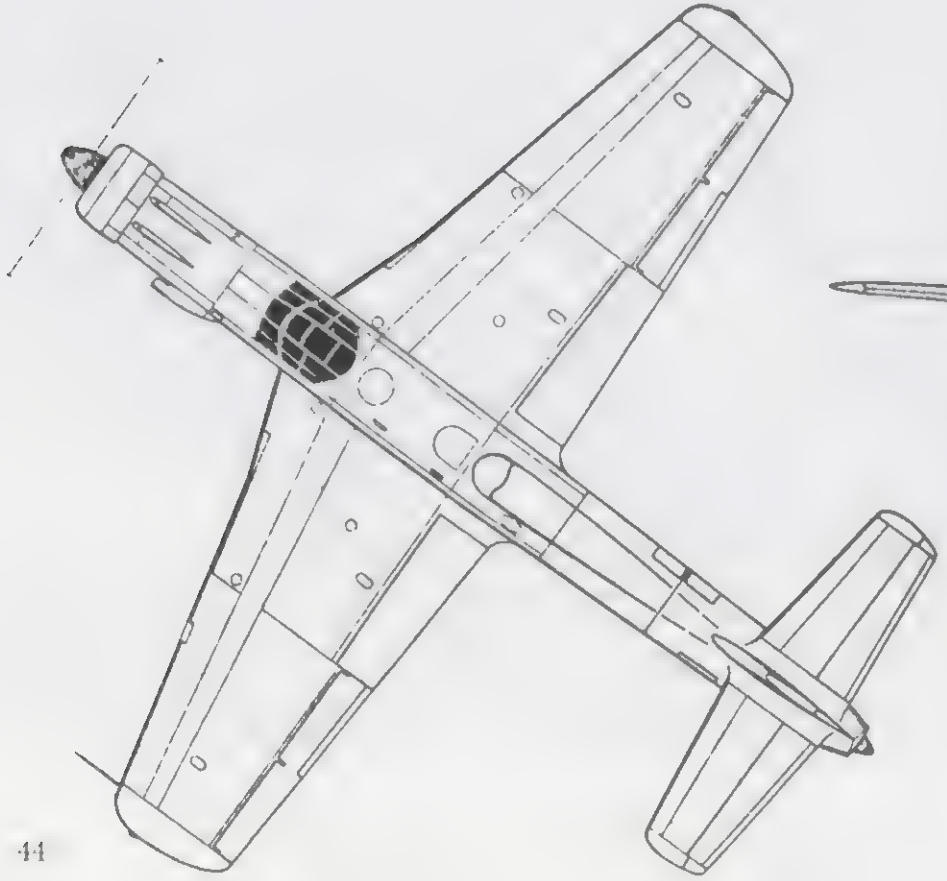
The same plane shortly before restoration was completed.

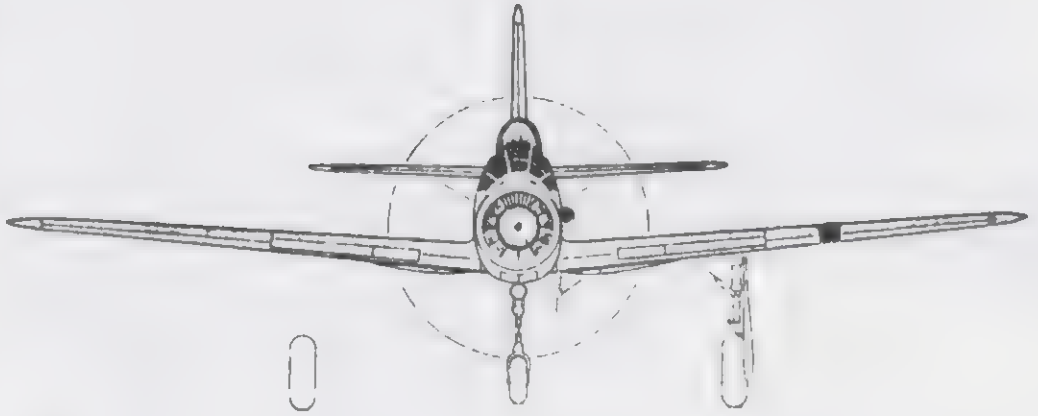
The team proudly presents the restored Do 335.

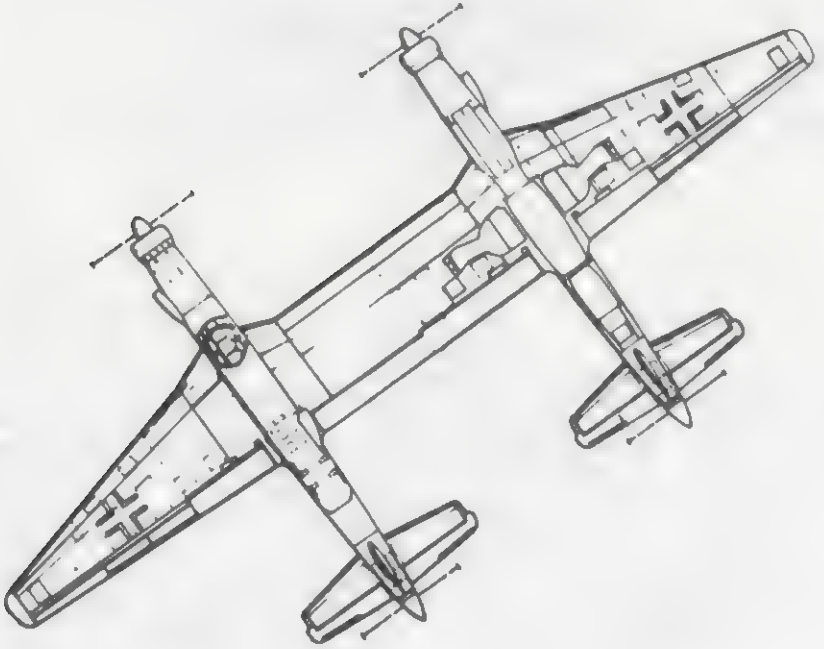
Now the Do 335 looks like new again!

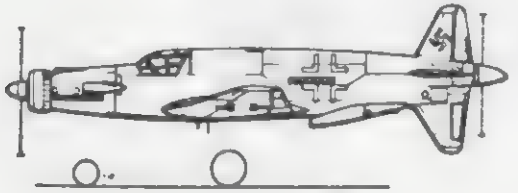
Do 435
Variation of the Do 335 A-1 with mixed powerplants, front DB 603 LA or Jumo 213 J, rear Heinkel He S 011 turbojet. Calculated speed increase: 60 to 70 kph.



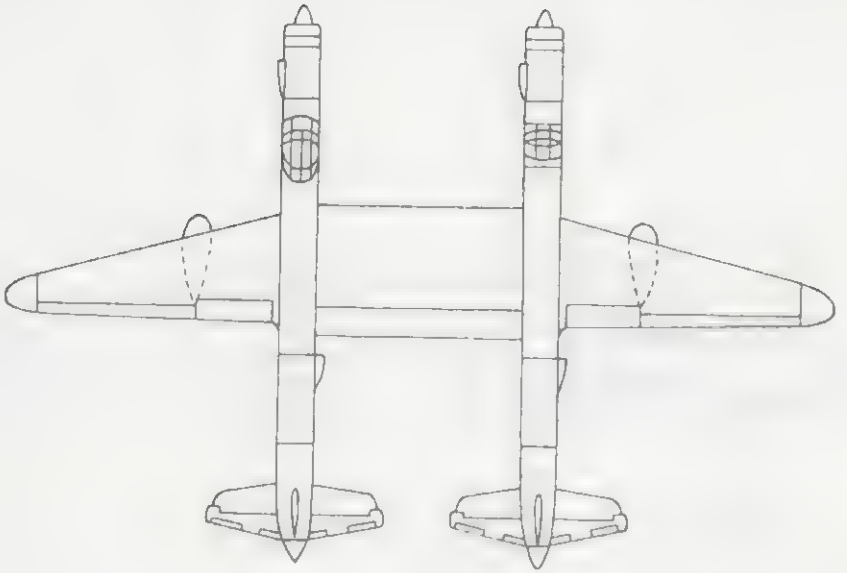


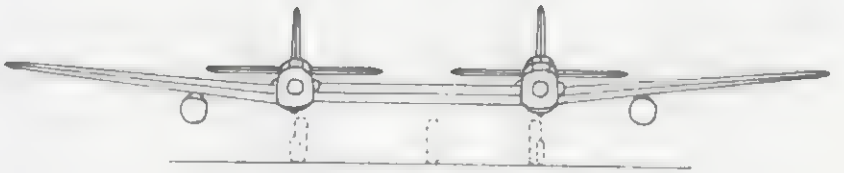


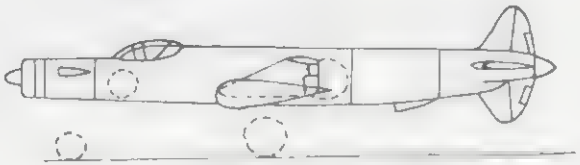




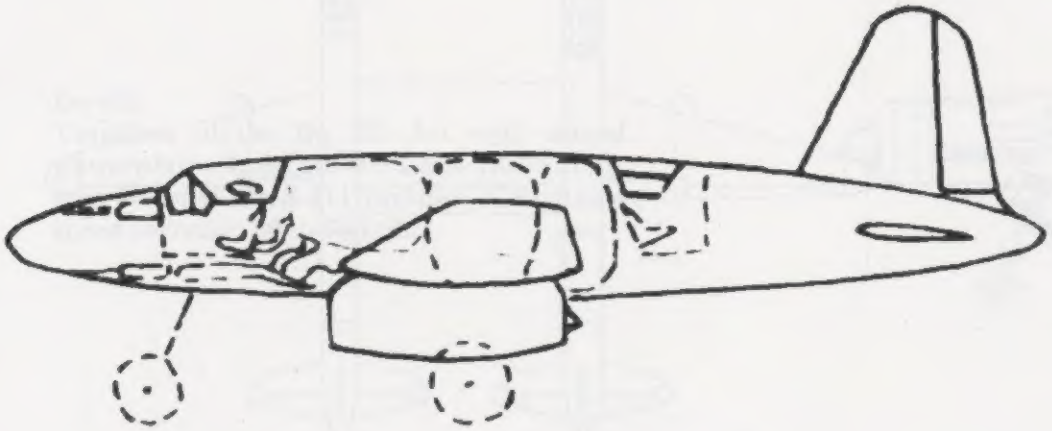
Do 635
Twin plane, like the He 111 Z. Development by Heinkel, first as Heinkel Project 1075, then officially designated Do 635. Powered by 4 Daimler-Benz 603 E motors. Cell developed from the Do 335 B.

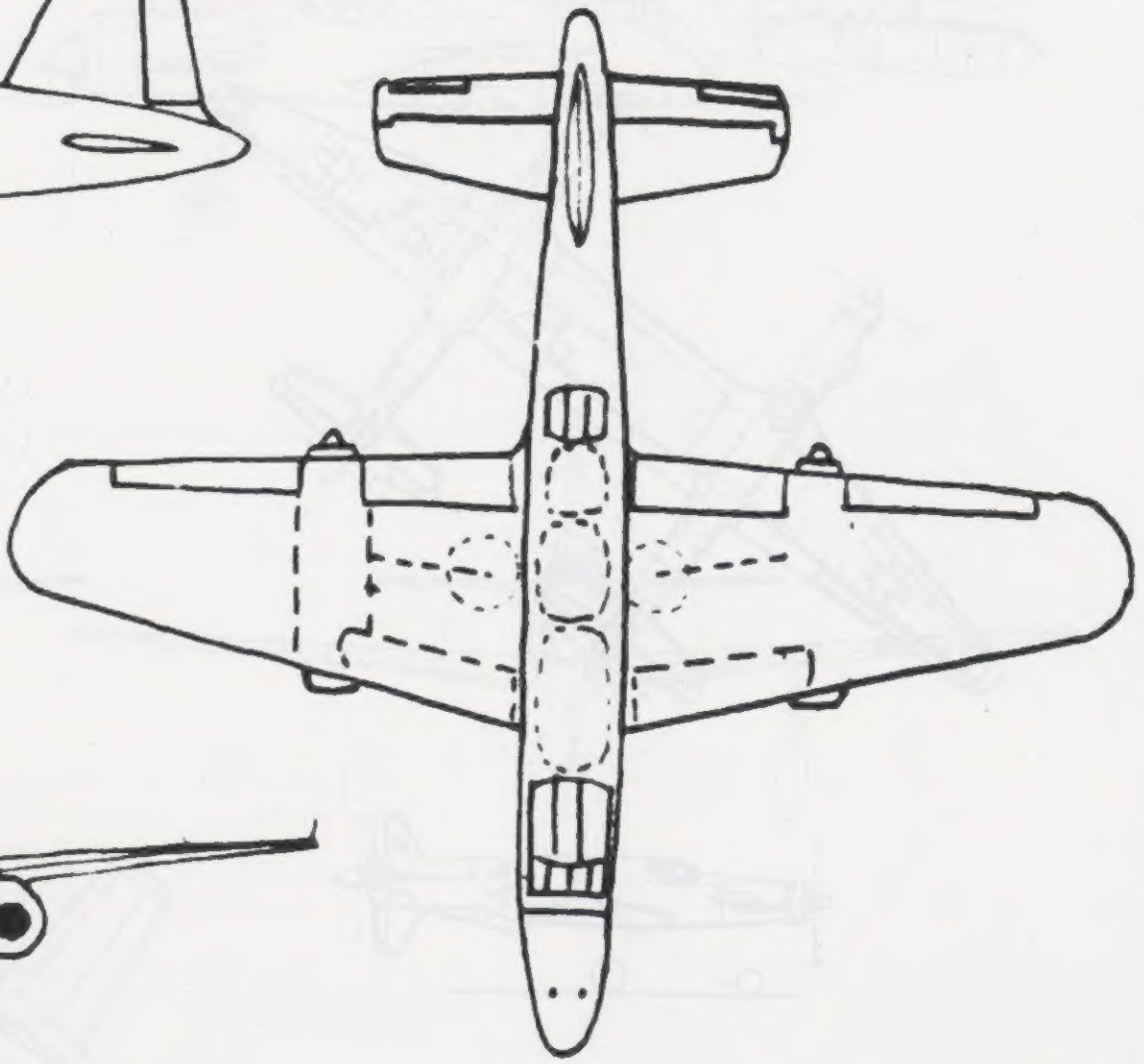






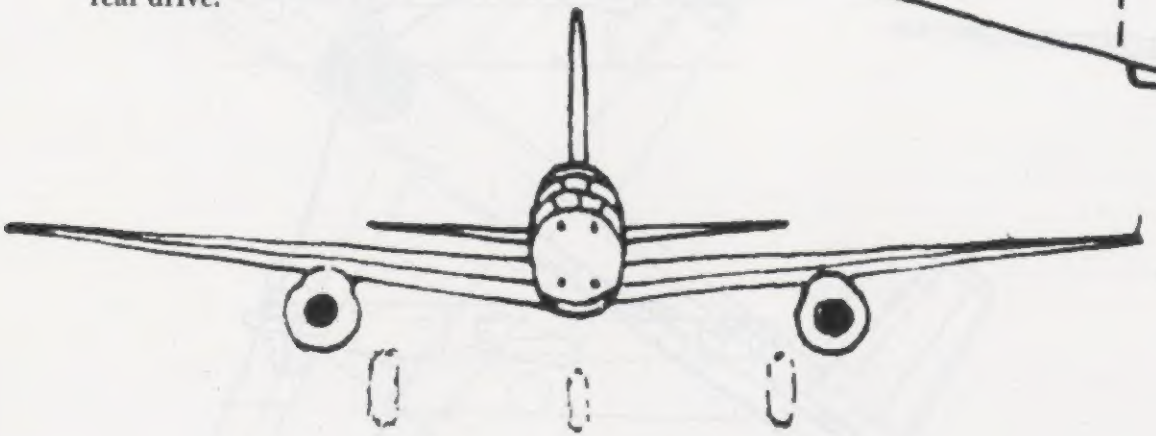
Ju 635
Heinkel development turned over to Junkers. Three-man crew, 4 DB 603 E motors with MW 50 fuel injection systems. Cancelled because of necessary pursuit-plane program.





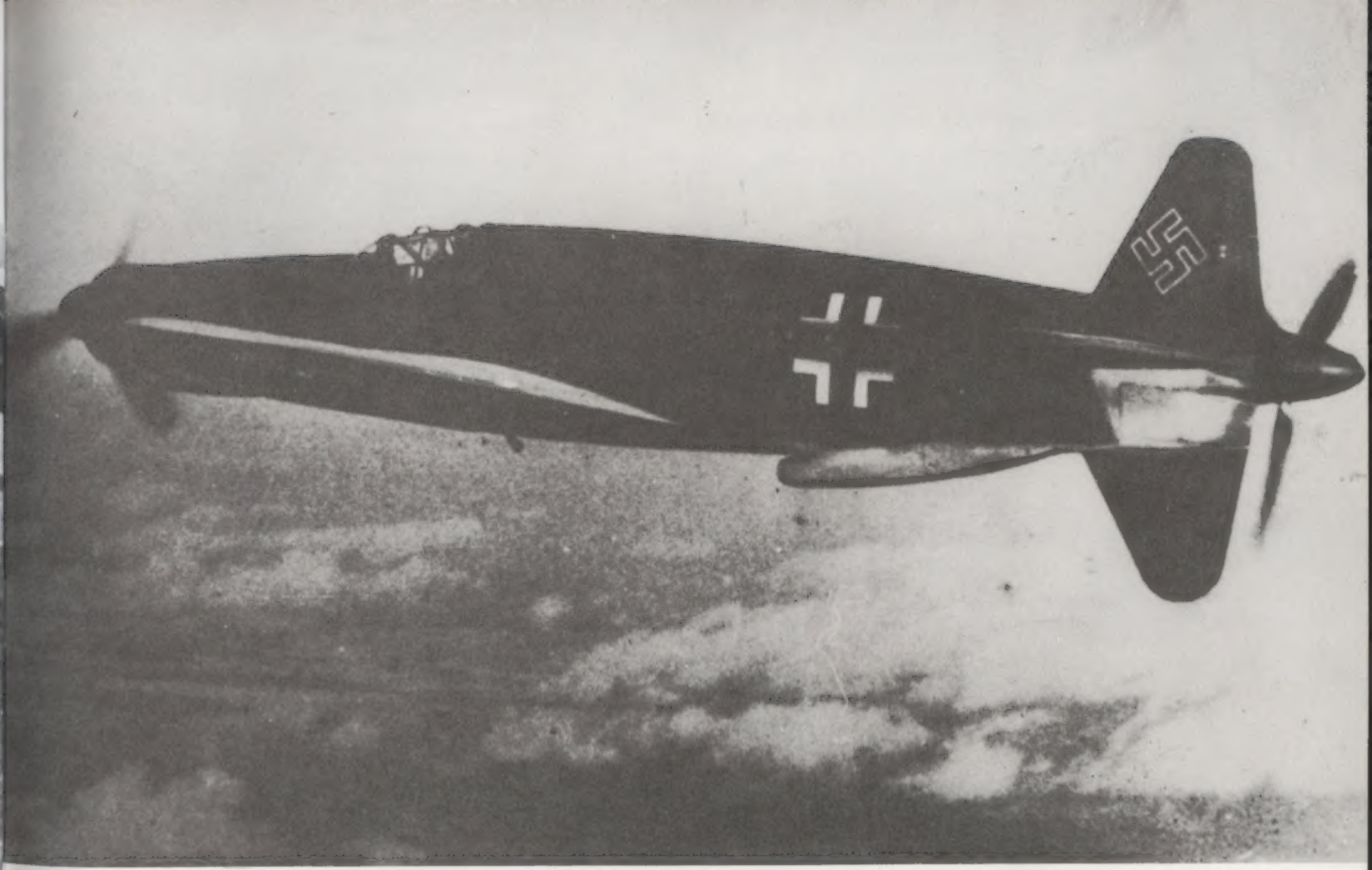
P.256
Cell of the Do 335 B but without motors, instead two He S 011 turbojets under wings, 2-man crew, armed with 4 MK 108 guns at the bow.

The later P 247 and P 252 projects had only rear drive.



TECHNICAL DATA

	Gö 9	Do 335 V 1	A-1	A-6	B-2	B-4
Crew	1	1	1	2	1	1
Powerplant	HM 60R	DB 603A	DB 603E	DB 603A	DB 603E	DB 603 LA
Horsepower	80	2 x 1.750	2 x 1.800	2 x 1.750	2 x 1.800	2 x 2.000
Wingspan (meters)	7,20	13,80	13,80	13,80	13,80	18,40
Length (meters)	6,80	13,85	13,85	13,85	13,85	13,85
Height (meters)	–	5,00	5,00	5,25	5,00	5,25
Wing surface (sq. meters)	–	38,50	38,50	38,50	38,50	43,00
Dry weight (kg)	–	7.105	7.320	7.400	7.360	7.730
Flying weight (kg)	720	8.700	8.700	10.100	10.000	10.100
Top speed (KPH)	220	770	775	688	770	770
Landing speed (KPH)	–	180	180	180	180	180
Service ceiling (meters)	–	11.500	11.500	10.190	10.190	12.500
Climbing speed (meters per minute)	–	8.000/11,3	8.000/10,8	8.000/12,5	–	–
Equipment	–	FuG 25 FuG 16 ZY	FuG 25 A FuG 125 FuG 16 ZY	FuG 25 A FuG 125 FuG 101 A FuG 16 ZY	wie A-1	wie A-6
Armament	–	2 MG 151	1 MK 103 2 MG 151	wie A-1	3 MK 103 2 MG 151	wie B-2



Dornier Do 335 V 1, CP+UA, on a test flight.

The restored Do 335

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